

Leafhoppers (Homoptera: Cicadellidae) associated with the Restionaceae. 1. The tribe Cephalelini (Ulopinae)

by

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The taxonomic characters of the Cephalelini leafhopper fauna (Homoptera: Cicadellidae: Ulopinae), associated with Restionaceae are described and illustrated. *Cephalelus* Percheron is redescribed and *Duospina* gen. nov. is described. Thirteen new species of *Cephalelus* are described: *C. appendiculatus*, *C. attenuatus*, *C. bilobatus*, *C. brevipilus*, *C. campbelli*, *C. cygnastylus*, *C. daviesi*, *C. gonubiensis*, *C. iwyae*, *C. nivenus*, *C. rawsonia*, *C. smithi* and *C. uncinatus*. Three species are redescribed: *C. angustatus* Evans, *C. bicoloratus* Evans and *C. turneri* Evans. *Cephalelus capensis* Evans is transferred to the new genus *Duospina*, to which the new species *D. sheilae* and *D. twanella* are also assigned. A key to the genera and species of the male South African Cephalelini is also provided.

INTRODUCTION

The Restionaceae, a major component of the fynbos, consists of a large number of variable species which occur in diverse habitats. The presentday range of the Restionaceae in South Africa extends from the south western Cape to as far as East London in the Eastern Cape.

At present, the Cicadellidae fauna associated with the Restionaceae is poorly known. In this paper, the first of two in a series, the two subfamilies of leafhoppers which are associated with Restionaceae in South Africa, i.e. the Ulopinae (tribe Cephalelini) and the Euscelinae (Tribes Athysanini and Paralimini) are described. Apart from the Cicadellidae, which are described in this paper, there is a large indigenous insect fauna associated with the Restionaceae. This fauna includes various species of Tingidae, belonging to the genera *Lullius* Distant and *Agramma* Stephens and Fulgoroidea of the genera *Stenoconchyoptera* Muir and *Turneriola* China. According to Dr. H. Geertsema (personal communication) lepidopterous larvae of the genera *Psycharium* Herrich-Schaeffer (Megalopygidae), *Sandaleu* Meyrick (Coleophoridae), *Orgyia* Ochsenheimer (Lymantriidae) and *Dalaca* Walker (Hepialidae) also feed on the Restionaceae. Scholtz & Holm (1985) have suggested that larvae of *Colophon* (Coleoptera: Lucanidae) might feed on the roots of Restionaceae.

Holotypes (unless stated otherwise) and some paratypes are deposited in the South African Museum, Cape Town (SAM) whereas the rest of the paratypes are

deposited in the British Museum (Natural History), London, (BMNH); University of Stellenbosch Collection, (USC) and the National Collection of Insects, Plant Protection Research Institute, Pretoria, (NCI).

TRIBE CEPHALELINI Evans

Crown long, acuminate. Ocelli on crown; reduced in males and wingless females but well developed in winged females. Pair of thyridia present between eyes. Head, thorax and tegmina densely punctate. Pronotum collar-shaped. Tegmina with obscured venation. Hind wings, when present, sometimes with reduced venation. Fore and middle legs short, with swollen femora and slender tibiae which are flat on outside and convex on inside; tibial spines few and very small. Hind legs longer than front and middle legs, tibial spines slightly larger than those of front legs and more abundant along edges.

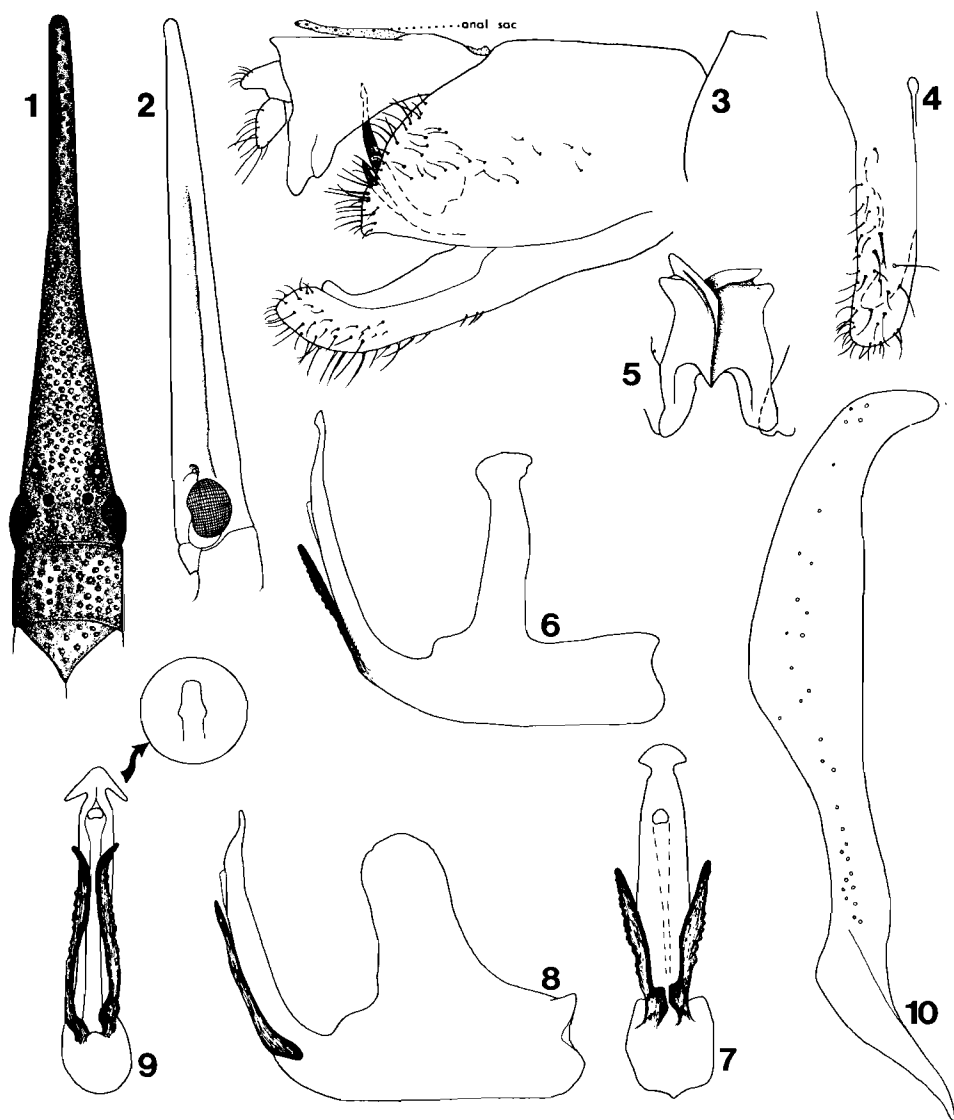
According to Linnavuori (1972), the Cephelelini is a group of relict Cicadellidae dating from Mesozoic times and it is of interest that the break-up of Gondwanaland and the resulting geographical isolation of populations has not led to striking generic differentiation in the tribe. The tribe Cephelelini are only associated with the host family Restionaceae. The Cephelelini occur in the south western and eastern Cape Province of South Africa, most of Australia and on the North Island of New Zealand. As the host family Restionaceae also occurs in southern Chile, Cephelelini might be present there too.

These slender, stick-shaped leafhoppers have an extremely elongate crown which tapers to a point anteriorly. The body shape and colouration (shades of brown) are probably extremely effective for camouflage and the leafhopper's sole means of protection lies in the fact that it closely resembles the sharp, dry leaf sheaths at each node along the stem of the plant. The leafhopper relies so much on this mimicry that it has become a poor jumper and all the males and the great majority of females have lost their hind wings and therefore the ability to fly. Fully winged females usually form about 3 to 4% of the total number of females collected, but in one locality 25% of the females collected at the end of summer were fully winged. These fully winged females obviously play an important role in the distribution of species. Apart from the possession of hind wings, the winged females also differ structurally from the flightless forms as shown in Table 1.

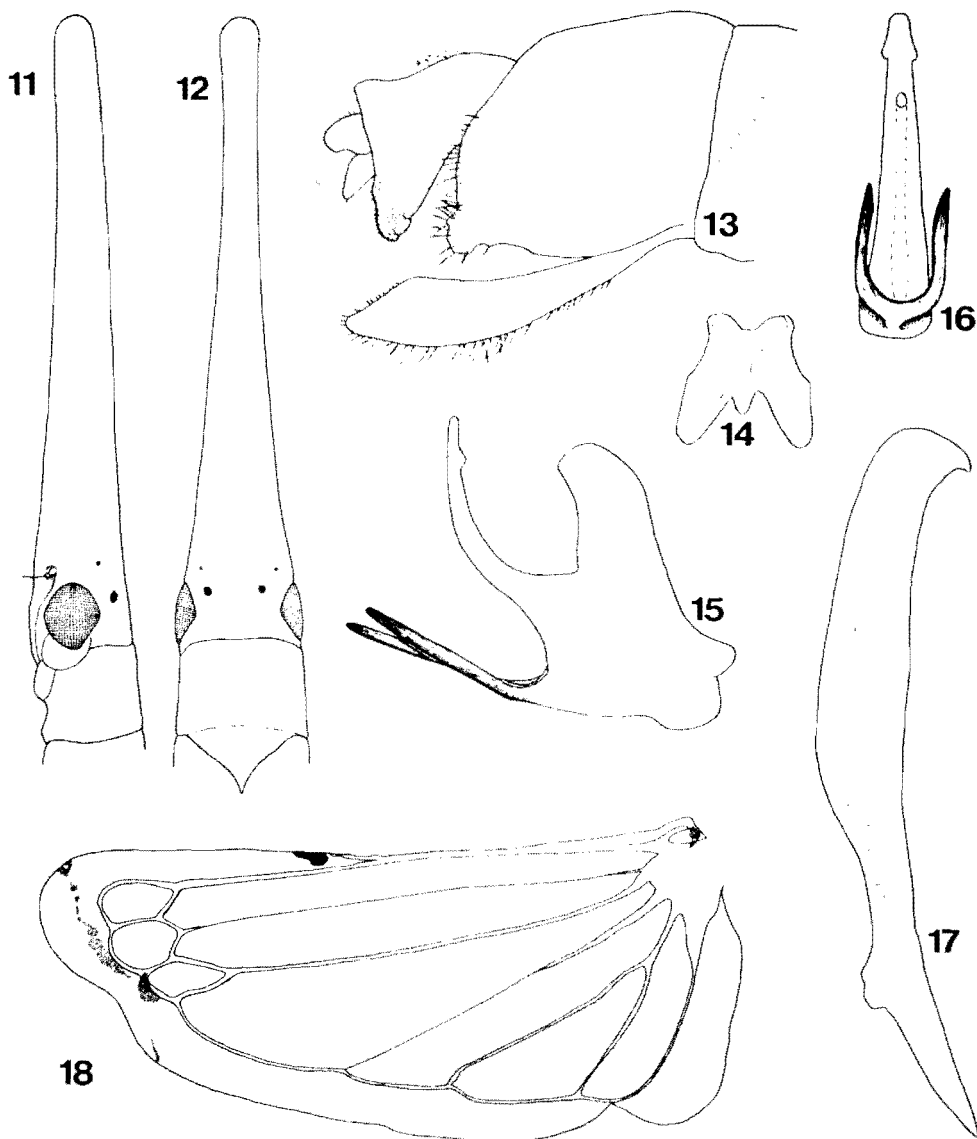
TABLE 1. Structural differences between females with hind wings and females without hind wings.

<i>Winged forms</i>	<i>Wingless forms</i>
Body slightly smaller than in wingless forms.	Body slightly larger than in winged forms.
Crown shorter and narrower with strongly developed middorsal and midventral ridges (Fig. 157).	Crown long and wide with weakly developed middorsal and midventral ridges.
Ocelli well developed.	Ocelli rudimentary or absent.
Pronotum anteriorly declivous and widest posteriorly, with marked posterior hump in lateral view.	Pronotum flat and parallel-sided with no hump in lateral view.
Tegmina partially sclerotized; venation distinct; claval suture well developed.	Tegmina completely sclerotized; venation obscure; claval suture absent.

All the polymorphic features exhibited in Table 1, by the fully winged form, seem to be concerned with their flying ability. The smaller body and less sclerotized tegmina lighten the insect. The humped shape of the pronotum, in lateral view (Fig. 157)



Figs 1–10. *Cephalelus angustatus* Evans. 1. Head and thorax, dorsal view. 2. Head, lateral view. 3. Pygofer, lateral view. 4. Plate. 5. Connective. 6 & 7. Aedeagus, lateral and ventral views. 8 & 9. Aedeagal variation, lateral and ventral views, with apical variation circled. 10. Style.



Figs 11–18. *Cephaletus brevipilus* sp. nov., holotype ♂. 11 & 12. Head and thorax, lateral and dorsal views. 13. Pygofer, lateral view. 14. Connective. 15 & 16. Aedeagus, lateral and ventral views. 17. Style. 18. Hind wing of winged female.

is probably associated with the accommodation of the large metathoracic flight muscles. Well developed ocelli are apparently important for orientation during flight. The occurrence of both winged and wingless forms within a species seems to be a feature of all genera of Cephelelini.

In copula, leafhoppers of the tribe Cephelelini assume a venter to venter position (Fig. 160). This position has also been observed in *Gannachrus* sp. (Agalliinae) and *Empoasca* sp. (Typhlocybinae) and the fact that these distantly related leafhoppers copulate in the same manner, seems to imply that this position might be the rule among leafhoppers. In the case of the copulating Cephelelini it was noted that the styles of the male were positioned under the seventh abdominal sternite of the female and could serve the purpose of exposing the genital opening of the female or they may provide additional leverage when inserting the aedeagal shaft (Fig. 159).

In some specimens of *Cephelelus angustatus* collected, the ovipositor was extended and illustrated a possible way in which the female could extend her ovipositor blades. The base of the ovipositor is curved sharply below its point of anchorage. The female apparently builds up haemostatic pressure, expanding the ventral membranous area above the ovipositor and thus levering the ovipositor blades out of the ovipositor sheaths and forcing them downwards, as in Fig. 158. This would obviously occur in combination with contraction of the muscles attached to the base of the ovipositor blades.

The Australian Cephelelini differ from South African Cephelelini in many respects, as is obvious from Table 2 (as no New Zealand Cephelelini were available for study, such a comparison will have to await further studies) and from the illustrations of the Australian species *Notocephalius hartmeyeri* Evans (Figs 150-155). Evans (1977) therefore has retained only the South African members of the tribe in the genus *Cephelelus*, transferring all the Australian Cephelelini to new genera.

TABLE 2. Differences between the Australian and South African members of the tribe Cephelelini.

<i>Australian Cephelelini</i>	<i>South African Cephelelini</i>
Body often dorsoventrally flattened.	Body never dorsoventrally flattened.
Face often concave.	Face never concave.
Eyes often flush with dorsal surface of the head.	Eyes never flush with dorsal surface of head.
Supra-antennal ridges present.	Supra-antennal ridges never present.
Tegmina pointed posteriorly.	Tegmina bluntly rounded posteriorly.
Ovipositor completely covered by tegmina.	Ovipositor visible beyond tegmina.
Membranous structure absent on dorsal surface of anal tube in male.	Membranous structure present on dorsal surface of anal tube in male.
Male anal tube often dorsoventrally flattened.	Male anal tube always cylindrical.
Style with well differentiated apophysis.	Style without distinct apophysis.
Connective not distinctly Y-shaped	Connective Y-shaped.

Key to genera and species of male South African Cephelelini

- 1 Styles with pair of apical appendages (Fig. 140) genus *Duospina* gen. nov. 17
- Styles without apical appendages (Fig. 10) genus *Cephelelus* Percheron 2
- 2 Pygofer rounded posterodorsally and posteroventrally with beak-like extension (Fig. 3) . . . 3
- Pygofer not as above 7
- 3 Aedeagus with pair of appendages (Figs 6 & 7) 4
- Aedeagus without appendages (Fig. 33) 6

- 4 Aedeagal appendages arising from base of shaft and spine-like with serrated outer edges (Figs 6 & 7) *C. angustatus* Evans
- Aedeagal appendages arising from base of socle and without serrated outer edges (Fig. 15) 5
- 5 Aedeagal appendages very large and spine-like, aedeagal shaft arising from middle of socle (Fig. 15) *C. brevipilus* sp. nov.
- Aedeagal appendages extremely small, varying in shape from tooth-like to spine-like, apex of shaft shovel-like or arrow-like (Fig. 26) *C. nivenus* sp. nov.
- 6 Apex of aedeagal shaft with pair of sub-apical teeth; uncinate in lateral view (Fig. 33) *C. uncinatus* sp. nov.
- Apex of aedeagal shaft with long sub-apical teeth, having the appearance of a blunt arrow-head or horse-shoe (Fig. 40) *C. attenuatus* sp. nov.
- 7 Pygofer with posteroventral lobe (Fig. 46) 8
- Pygofer without posteroventral lobe 16
- 8 Aedeagus with pair of appendages arising ventrally from base of shaft (Fig. 49) 9
- Aedeagus without appendages 13
- 9 Aedeagal shaft with dorsally angled, triangular teeth at mid-length on shaft (Fig. 49); crown with well developed mid-dorsal and mid-ventral ridges 10
- Aedeagal shaft without triangular teeth; crown without well developed mid-dorsal and mid-ventral ridges 11
- 10 Teeth on dorsal surface of shaft poorly defined; aedeagal appendages large and close to shaft (Fig. 49); apex of crown swollen (Fig. 45) *C. ivyae* sp. nov.
- Teeth on dorsal surface of shaft well defined; aedeagal appendages relatively small and diverging (Fig. 57); apex of crown not swollen (Fig. 52) *C. rawsonia* sp. nov.
- 11 Aedeagal shaft dorsoventrally flattened and dorsal surface very concave (Fig. 78); gonopore squarish in shape (Fig. 79) *C. turneri* Evans
- Aedeagal shaft cylindrical (Fig. 62); gonopore 'tear-drop' in shape (Fig. 63) 12
- 12 Aedeagal appendages with right-angled elbow (Fig. 72); crown short (Fig. 67) *C. campbelli* sp. nov.
- Aedeagal appendages without right-angled elbow (Fig. 62); crown long (Fig. 59) *C. gonubiensis* sp. nov.
- 13 Aedeagal shaft with dorsal surface concave (Fig. 86) 14
- Aedeagal shaft with dorsal surface not concave 15
- 14 Pygofer with broad posterior lobe in addition to smaller posteroventral lobe (Fig. 82); gonopore large and squarish in shape (Fig. 85) *C. bilobatus* sp. nov.
- Pygofer with posteroventral lobe relatively long (Fig. 94); gonopore elongate (Fig. 92) *C. smithi* sp. nov.
- 15 Aedeagal shaft with well developed triangular lateral extensions at mid-length (Fig. 101) *C. daviesi* sp. nov.
- Apical half of aedeagal shaft with two pairs of closely set, small, tooth-like lateral extensions (Fig. 108) *C. bicoloratus* Evans
- 16 Crown apically acute (Fig. 113); pygofer rounded in shape (Fig. 115); aedeagus compact with appendages arising laterally from shaft which is ventrally concave (Fig. 118) *C. cygnastylus* sp. nov.
- Crown apically swollen (Fig. 120). Pygofer rectangular (Fig. 122); aedeagus very large with large Y-shaped ventral, subapical appendages (Fig. 124) *C. appendiculatus* sp. nov.
- 17 Socle in lateral view with triangular, finger-like structure protruding from ventral surface below shaft (Fig. 138) 18
- Aedeagus without above finger-like structure (Fig. 132) *D. capensis* Evans
- 18 Crown narrow at mid-length and expanding towards apex, with strong middorsal and midventral ridges (Fig. 135) *D. twanella* sp. nov.
- Crown spatulate in shape with weakly developed mid-dorsal ridge (Fig. 142) *D. sheilae* sp. nov.

Genus *Cephalelus* Percheron**Cephalelus** Percheron, 1832: pl. 48**Dorydium** Burmeister, 1835: 104; Burmeister 1839: 41–42

The genus *Cephalelus* was erected by Percheron (1832), with *Cephalelus infumatus* Percheron as the type-species. No type-locality is denoted for *C. infumatus* in the original description, but Burmeister (1839) names South Africa. Apparently the holotype of *C. infumatus* was lost long ago, because Signoret already stated in 1879 that it was not present in the Museum National d'Histoire Naturelle, Paris. The female labelled as the type of *C. infumatus*, which is now housed there, is certainly a different species. The hind margin of its seventh abdominal sternite does not possess the deep V-shaped median cleft illustrated by Percheron in *C. infumatus*. As a matter of fact no South African female of Cephalelini, matching this structure, has yet been found. In 1835 Burmeister described the genus *Dorydium*, with *Dorydium paradoxum* as the type species, but in a later publication (1839) he synonymized it with *Cephalelus*. Unfortunately Burmeister's type-specimens of *Dorydium paradoxum* could also not be located.

In 1947 Evans reviewed the genus *Cephalelus* and assigned a further four new South African species, namely, *C. turneri*, *C. capensis*, *C. bicoloratus* and *C. angustatus*, to it. In the description of the above-mentioned species Evans used only external characters and made no use of the male genitalia. In 1972 Linnavuori revised the genus and the species and included detailed descriptions of the male genitalia. Unfortunately his association of males with the holotype females of *C. angustatus* and *C. bicoloratus* proved to be incorrect. He also described a presumptive male of *C. infumatus*, yet to date I have not found any female which has a seventh abdominal sternite matching Percheron's figure and no South African male could therefore be associated with it.

The genus *Cephalelus* can be defined as follows: Slender stick-shaped leafhoppers. Body brown in colour. Face below eyes very short and broad; anteclypeus strongly convex, tapering apically; frontoclypeus flattened, lateral frontal suture extending as furrow to deep antennal pit; fronto-clypeus distally forming median keel which extends to apex of crown; lorum small; gena narrow. Antenna very short. Crown convex, sloping laterally. Scutellum small, punctate; transverse furrow indistinct. Tegmen densely punctate, long and narrow with obscure venation; epipleuron ventrally flattened and bearing single row of hairs. Male with hind wings atrophied; female rarely with well-developed hind wing (Fig. 18).

Pygofer of male of two main types, i.e. those posterodorsally rounded with a posteroventral beak-like extension (Fig. 3) and those with posteroventral lobe (Fig. 46); exceptions are *C. appendiculatus*, with rectangular lobe (Fig. 122) and *C. cygnastylus* with more rounded lobe (Fig. 115). Anal tube pear-shaped and bearing peculiar membranous structure of unknown function (anal sac) on dorsal surface (Fig. 156). Aedeagus symmetrical; aedeagal shaft simple or provided with paired appendages on ventral side; socle relatively large. Connective short, robust and Y-shaped. Style narrow, elongated with no distinct preapical angle.

Cephalelus angustatus Evans, Figs 1–10, 19**Cephalelus angustatus** Evans, 1947: 146**Cephalelus angustatus** Evans; Linnavuori, 1972: 142. (misidentification)

MALE. Length from apex of crown to tip of tegmen 7.33–14.83 mm; trans-ocular width 0.94–1.34 mm; greatest width of pronotum 0.56–0.80 mm; median length

of crown 3.00–7.25 mm; crown 7.54–8.24 × as long medially as pronotum; crown very long and very acute apically (Figs 1–2).

Pygofer rounded posterodorsally and posteroventrally with beak-like extension; posteroventral margin with relatively long setae (Fig. 3). Aedeagal shaft dorsoventrally flattened; apex fan-shaped; base of shaft with pair of spine-like appendages which vary in shape from short and broad to slender elongate appendages; outer edges of appendages serrated; angle of divergence of these appendages variable (Figs 6–9). Connective as in Fig. 5. Style elongate with blunt apex curving laterally (Fig. 10). Plate as in Fig. 4.

FEMALE. Length from apex of crown to tip of tegmen 13.66–15.16 mm; length from apex of crown to tip of ovipositor 17.50–19.00 mm; transocular width 1.36–1.48 mm; greatest width of pronotum 1.34–1.42 mm; median length of crown 6.75–7.66 mm; crown 8.43–8.51 × as long medially as pronotum; Hind margin of seventh abdominal sternite as in Fig. 19.

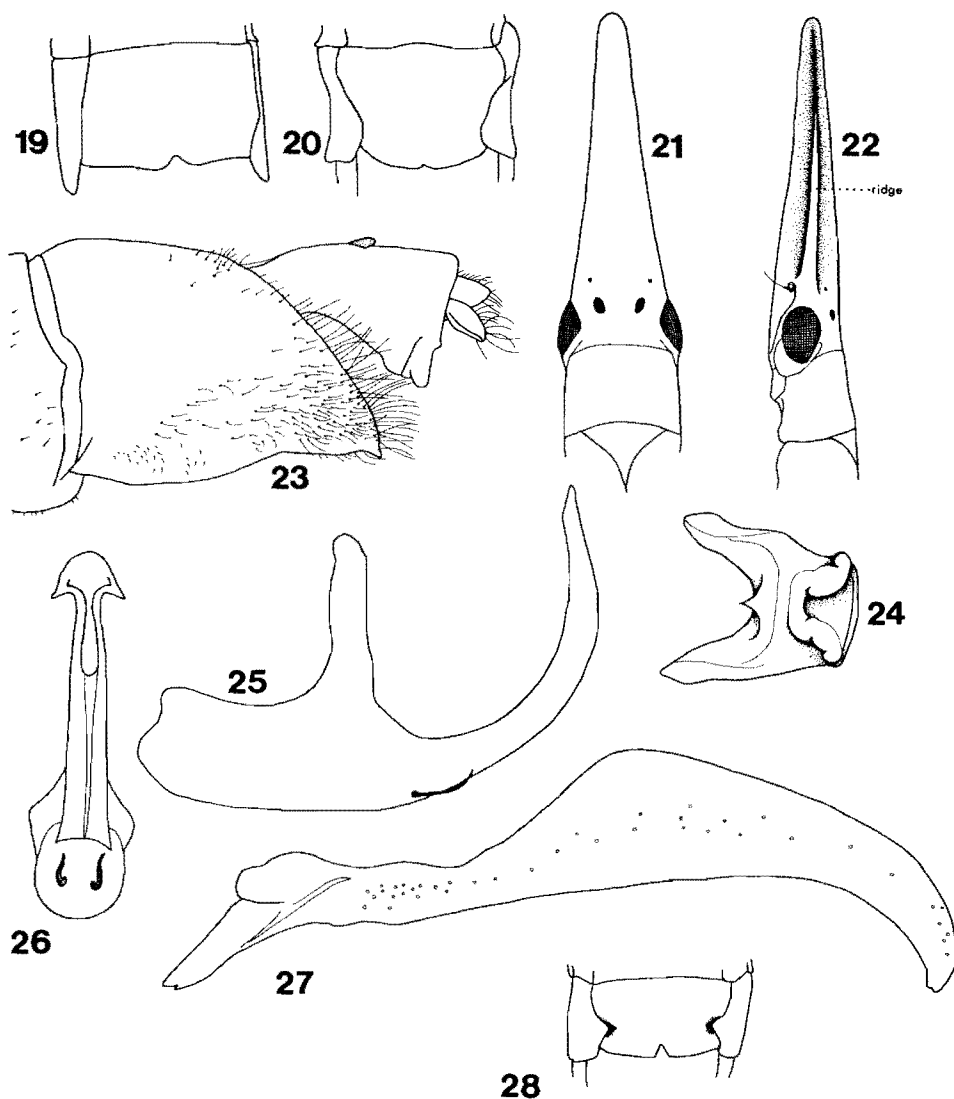
MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Swellendam, Cape Province, ii.1932, R. E. Turner [34° 1' S, 20° 26' E] (BMNH). The following additional specimens were examined: 6 ♂, Clanwilliam, 19.i.1983, J. G. Theron [32° 11' S, 18° 55' E]; 7 ♂, Worcester, 23.i.1985, D. M. Davies [33° 39' S, 19° 27' E]; 1 ♂, Ysterfontein, Darling, 18.ii.1969, J. G. Theron [33° 21' S, 18° 10' E]; 11 ♂, Du toits kloof pass, 23.i.1985, D. M. Davies [33° 43' S, 19° 5' E]; 2 ♂, Jonkershoek Stellenbosch, iv.1950, H. K. Munro [33° 57' S, 18° 54' E]; Stellenbosch, Jonkershoek, J. G. Theron [33° 57' S, 18° 54' E]; 2 ♂, 15.xii.1971; 1 ♂, 17.iii.1982; 19 ♂, 11 ♀, 15.iv.1982 (B.M.N.H.); 7 ♂, 6.v.1982; 3 ♂, 8.vii.1982; 5 ♂, Franschoek Pass, 12.iv.1984, D. M. Davies [33° 58' S, 19° 10' E]; 4 ♂, Disa Falls, Villiersdorp, 16.i.1985, D. M. Davies [33° 59' S, 19° 18' E]; 9 ♂, Cape Point, 3.v.1985, D. M. Davies [34° 14' S, 18° 25' E]; 1 ♂, Brenton, Knysna, 15.i.72, J. G. Theron [34° 1' S, 23° 3' E].

REMARKS. The holotype (collected at Swellendam, Cape Province, by R. E. Turner during February of 1932), which is housed in the British Museum (Natural History), was examined by me and proved to be a male, not a female as stated by Evans. This species closely resembles *C. uncinatus* in external appearance, but can be distinguished by the aedeagal appendages which arise from the base of the shaft and are spine-like with serrated outer edges. Its genitalia are markedly different from those described for *C. angustatus* by Linnavuori. The specimens, which Linnavuori (1972) assigned to *C. angustatus*, are here described as a new species *C. uncinatus*.

Cephalelus brevipilus sp. nov., Figs 11–18, 20

MALE. Body parchment brown to dark brown in colour. Length from apex of crown to tip of tegmen 10.83 mm; transocular width 1.18–1.20 mm; greatest width of pronotum 1.14–1.16 mm; median length of crown 5.08 mm; crown 7.47–7.69 × as long medially as pronotum (Figs 11–12).

Pygofer with posteroventral region shagreened, apically with short, ventrally curved process; posterior margin with relatively stout setae (Fig. 13). Aedeagal shaft simple, separated from appendages and arising from middle of socle; apex spatulate.



Figs 19–28. *Cephaletus* spp. 19. Seventh abdominal sternite of *C. angustatus* female. 20. Seventh abdominal sternite of *C. brevipilus* ♀. 21–28. *C. nivenus* **sp. nov.**, holotype ♂. 21 & 22. Head and thorax, dorsal and lateral views. 23. Pygofer, lateral view. 24. Connective. 25 & 26. Aedeagus, lateral and ventral views. 27. Style. 28. Seventh abdominal sternite of ♀.

Socle very large in relation to shaft and with pair of large spine-like appendages arising near base (Figs 15–16). Connective as in Fig. 14. Style elongate and apex bluntly curved as in Fig. 17.

FEMALE. Length from apex of crown to tip of tegmen 10,83–11,33 mm; transocular width 1,28–1,42 mm; greatest width of pronotum 1,26–1,30 mm; median length of crown 4,50–4,92 mm; seventh abdominal sternite as in Fig. 20. Venation of hind wing of female (in winged form) as in Fig. 18.

MATERIAL EXAMINED. Holotype, ♂ SOUTH AFRICA: Suurvlaak, Wolseley, 16.iii.1971, J. G. Theron [33° 25' S, 19° 12' E] (SAM). PARATYPES: 1 ♀ (wingless), 1 ♀ (winged), same data as holotype (U.S.C); 1 ♂, Cape Point, 4.iii.1978, J. G. Theron [34° 14' S, 18° 25' E] (BMNH).

REMARKS. This species differs from the other species in that the aedeagal shaft arises from the middle of the socle. This is the only known South African *Cephalelus* species in which the female may be macropterous, i.e. in which the ovipositor does not extend beyond the tips of the tegmina (as is also the case in most Australian species of *Cephalelini*.)

Cephalelus nivenus sp. nov., Figs 21–28

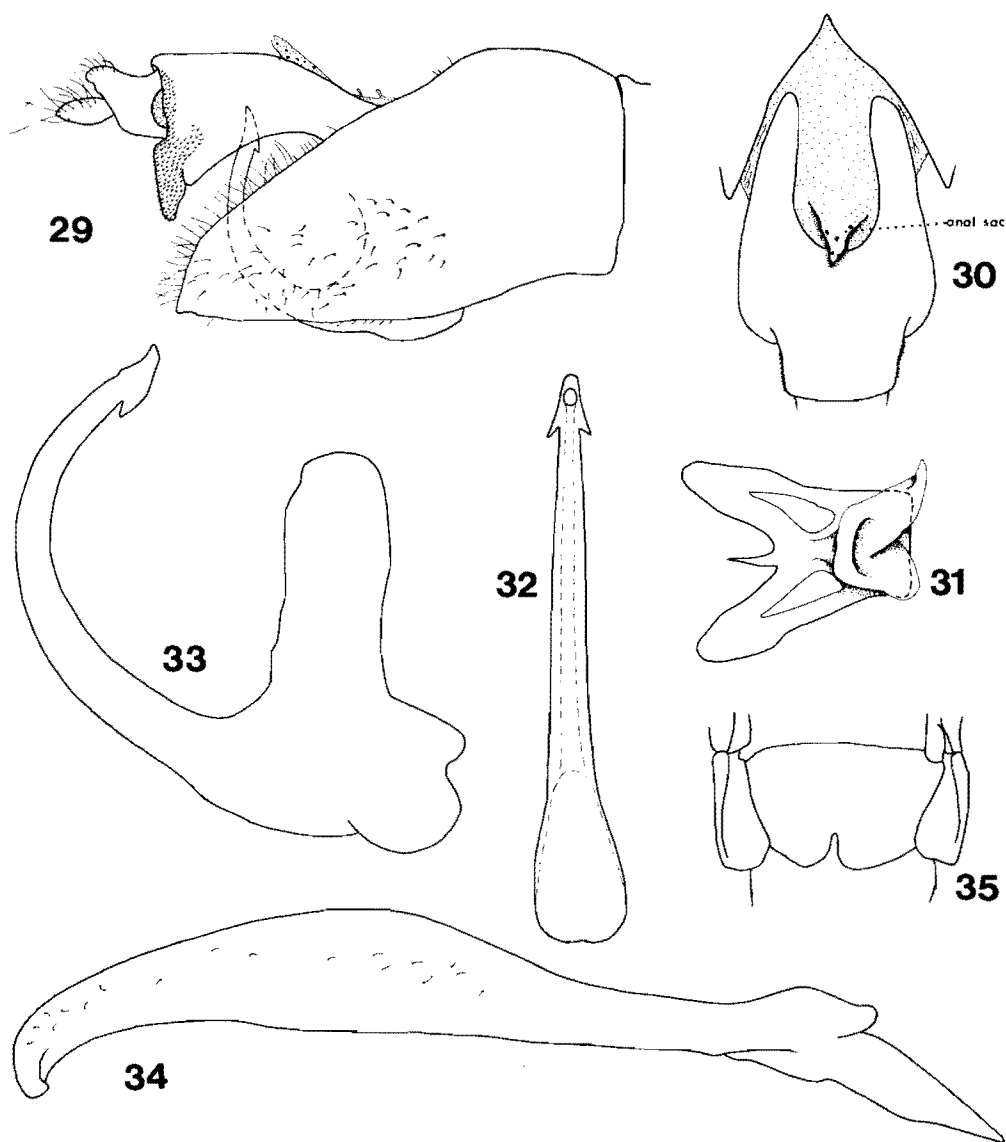
Cephalelus bicoloratus Evans; Linnavuori, 1972:142 (misidentification)

MALE. Body dark red brown in colour. Length from apex of crown to tip of tegmen 8,66–12,16 mm; transocular width 1,20–1,32 mm; greatest width of pronotum 1,14–1,30 mm; median length of crown 3,50–5,41 mm; crown 5,00–6,60 × as long medially as pronotum. Crown arrow-shaped and of medium length (Figs 21–22).

Pygofer lobes in lateral view very similar to those of *C. angustatus* but more densely setose (Fig. 23). Aedeagal shaft dorsoventrally flattened, apex varying in shape from shovel-like to broad arrow-shaped; base of shaft with pair of extremely small appendages varying in shape from tooth-like to spine-like (Figs 25–26). Connective as in Fig. 24. Style elongate, broad at mid-length with apex curving laterally (Fig. 27).

FEMALE. Length from apex of crown to tip of tegmen 8,33–10,00 mm; length from apex of crown to tip of ovipositor 10,33–11,66 mm; transocular width 1,22–1,44 mm; greatest width of pronotum 1,24–1,46 mm; length of crown 3,58–4,50 mm; crown 4,71–5,23 × as long as pronotum; seventh abdominal sternite as in Fig. 28.

MATERIAL EXAMINED. Holotype, ♂ SOUTH AFRICA: Cape Point, 4.iii.1978, J. G. Theron [34° 14' S, 18° 25' E] (SAM). PARATYPES: 8 ♂, same data as in holotype (BMNH); 8 ♂, 5 ♀, Cape Point, 3.v.1985, D. M. Davies (BMNH); 4 ♂, 1 ♀, Cape Point, 28.iv.1985, M. Wright; 1 ♀, Scarborough, 3.v.1985, D. M. Davies [34° 9' S, 19° 21' E]; 1 ♀, Graafwater, x.1947, S.A. Museum expedition [32° 9' S, 18° 38' E] (SAM); 1 ♂, Jonkershoek, Stellenbosch, 1.xii.1970, J. G. Theron [33° 57' S, 18° 54' E]; 1 ♂, du Toits kloof, 23.i.1985, D. M. Davies [33° 43' S, 19° 5' E]; 4 ♂, Franschhoek Pass, 16.i.1985, D. M. Davies [33° 58' S, 19° 10' E]; 1 ♂, Bainskloof Pass, 8.iii.1985, D. M. Davies [33° 35'



Figs 29–35. *Cephalelus uncinatus* sp. nov., holotype ♂. 29. Pygofer, lateral view. 30. Anal tube, dorsal view. 31. Connective. 32 & 33. Aedeagus, ventral and lateral views. 34. Style. 35. Seventh abdominal sternite of ♀.

S, 19° 9' E]; 1 ♂, State Forest, Swellendam, 13.x.1972, J. G. Theron [34° 1' S, 20° 26' E]; 1 ♂, Slagboom, Ceres, 13.xii.1969, J. G. Theron [33° 14' S, 19° 17' E].

REMARKS. Specimens from the Hottentots Holland region have a longer and more acute crown than those from the Cape Peninsula. They are also lighter brown in colour and have a pair of parallel dark, median lines between the eyes and medially on the pronotum. Very pale specimens may lack these markings. Moreover the pygofer lobes are more slender and less setose than in those from the Cape Peninsula, the aedeagal shaft is more slender and the styles are not as broad at mid-length. The differences between specimens from the Cape Peninsula and the inland regions are often striking but the characters overlap to such an extent that separation into different species does not seem justifiable.

Linnavuori (1972) incorrectly identified specimens of this species as *C. bicoloratus* Evans. A female, housed in the Museum National d'Histoire Naturelle, Paris, probably also belongs here.

The host plant of this species is *Elegia capensis* (Burm.f.) Schelpe.

This species differs from the other species in that it has extremely small spines ventrally on the base of the shaft.

***Cephalelus uncinatus* sp. nov., Figs 29–35**

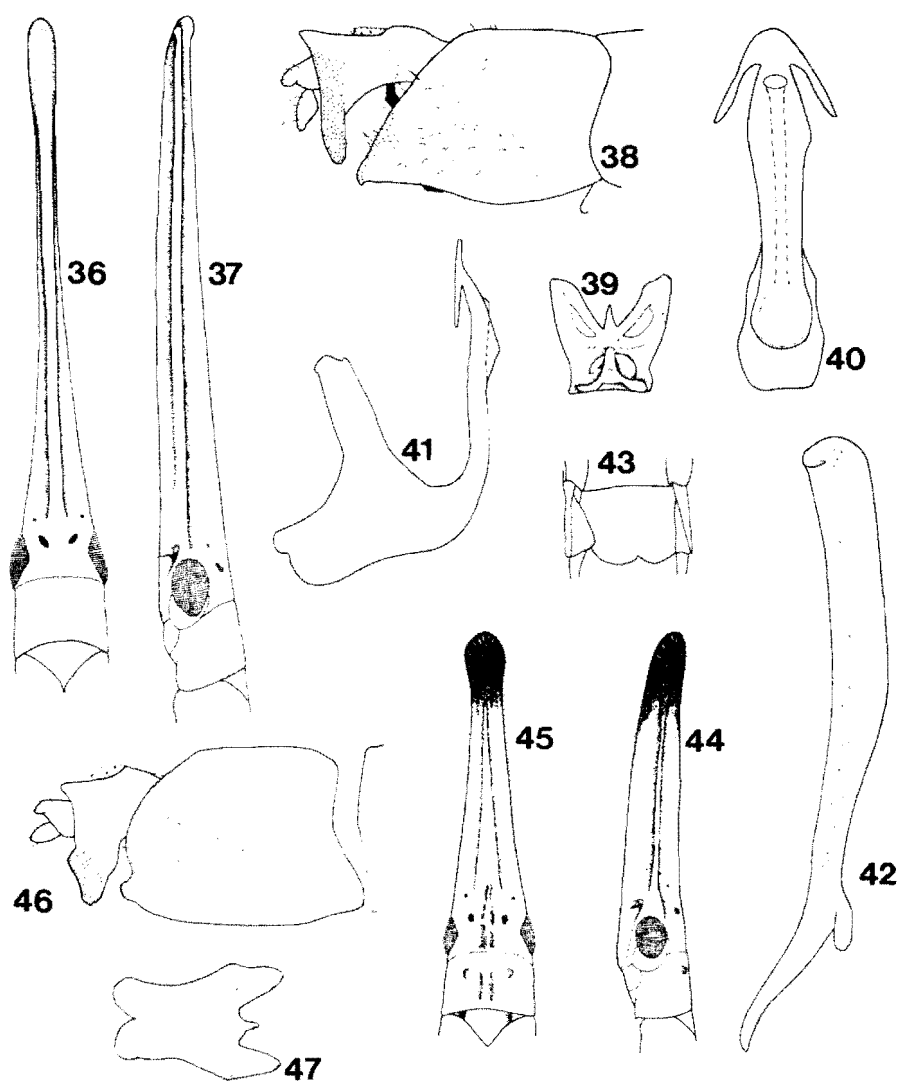
Cephalelus angustatus Evans; Linnavuori, 1972:142 (misidentification)

MALE. Length from apex of crown to tip of tegmen 11.00–13.80 mm; transocular width 1.14–1.40 mm; greatest width of pronotum 1.18–1.40 mm; median length of crown 4.92–6.20 mm; crown 7.23–7.38 × as long medially as pronotum. External appearance as in *C. angustatus*, but tegmina markedly broader, especially in lateral view.

Posterodorsal margin of pygofer more sloped than in *C. angustatus* (Fig. 29). Anal tube middorsally with arch-shaped membranous area giving rise to very short anal sac (Fig. 30). Aedeagal shaft tubular and uncinat in lateral view. Aedeagus considerably larger than in most other *Cephalelus* species (Figs 32–33). Connective as in Fig. 31. Styles as in Fig. 34.

FEMALE. Length from apex of crown to tip of tegmen 11.83–13.17 mm; length from apex of crown to tip of ovipositor 14.00–15.00 mm; transocular width 1.44–1.54 mm; greatest width of pronotum 1.46–1.64 mm; length of crown 5.75–6.58 mm; crown 4.69–4.76 × as long as pronotum; seventh abdominal sternite as in Fig. 35.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Jonkershoek, Stellenbosch, 28.x.1968, J. G. Theron [33° 57' S, 18° 54' E] (SAM). PARATYPES: 6 ♂, Cedarberg, 12.x.1971, J. G. Theron [32° 26' S, 19° 7' E]; 5 ♂, Cedarberg, Clanwilliam, 21.xii.1976, J. G. Theron; 1 ♂, Lindeshof, Ceres, 12.x.1971, J. G. Theron [33° 22' S, 19° 19' E]; 8 ♂, Piketberg, Mtn Top, 17.xii.1981, J. G. Theron [32° 55' S, 18° 46' E] (BMNH); 6 ♂, Hopefield, 1.x.1970, J. G. Theron [33° 4' S, 18° 21' E]; 9 ♂, Langebaan Rd, 18.xii.1981, G. Höppner [33° 4' S, 18° 4' E] (BMNH); 4 ♂, Milnerton, 1.xi.1976, J. G. Theron [33° 50' S, 18° 29' E]; 2 ♂, Milnerton, 17.xii.1984, D. M. Davies; 1 ♂, Camps Bay, Cape Town, 12.x.1948, H. K. Munro [34° S, 18° 21' E]; 3 ♂, Kirstenbosch,



Figs 36–47. *Cephelelus* spp. 36–43. *C. attenuatus* **sp. nov.**, holotype ♂. 36 & 37. Head and thorax, dorsal and lateral views. 38. Pygofer, lateral view. 39. Connective. 40 & 41. Aedeagus, ventral and lateral views. 42. Style. 43. Seventh abdominal sternite of ♀. 44–47. *C. ivyae* **sp. nov.**, holotype ♂. 44 & 45. Head and thorax, lateral and dorsal views. 46. Pygofer, lateral view. 47. Connective.

17.xii.1984, D. M. Davies [34° S, 18° 25' E]; 6 ♂, Gordon's Bay, 23.xi.1977, J. G. Theron [34° 9' S, 18° 52' E]; Kleinmond, J. G. Theron, 1 ♂, 18.xi.1969; 1 ♂, 23.xi.1977 [34° 21' S, 19° 2' E]; 3 ♂, Pearly beach, 15.xii.1971, J. G. Theron [34° 37' S, 19° 25' E]; 1 ♂, Salmonsdam, Stanford, 1.x.1972, J. G. Theron [34° 27' S, 19° 27' E]; 10 ♂, 2 ♀, Baardskeerdersbos, 14.xii.1971, J. G. Theron [34° 36' S, 19° 34' E]; 1 ♂, Viljoen's pass, 5.xii.1974, J. G. Theron [34° 4' S, 19° 3' E]; 1 ♂, Robinson pass, 30.i.1980, J. G. Theron [33° 50' S, 22° 2' E].

REMARKS. This species differs from the other species in that it is a simple aedeagus which is uncinate in lateral view and an arch-shaped membranous area which gives rise to the anal sac. Linnavuori (1972) incorrectly assigned this species to *C. angustatus*.

***Cephaleus attenuatus* sp. nov., Figs 36–43**

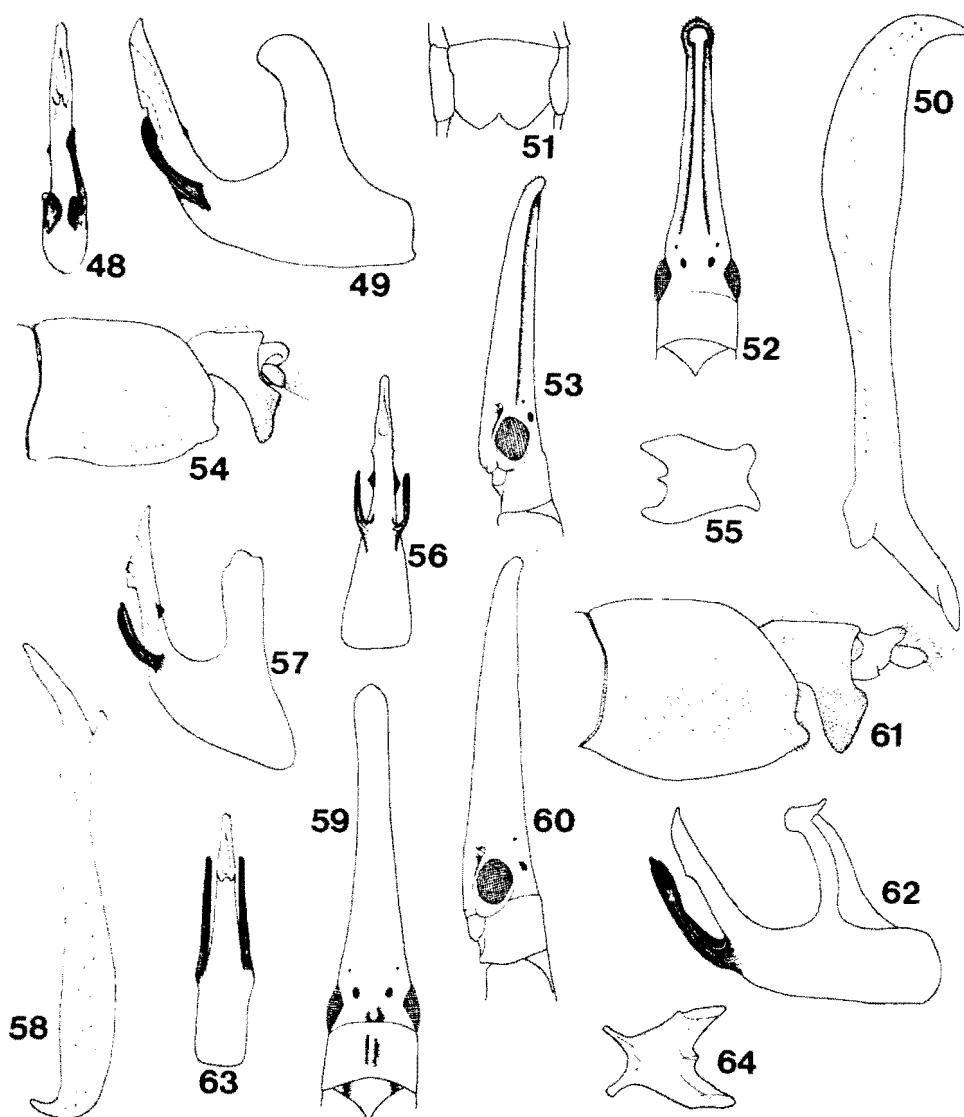
MALE. Length from apex of crown to tip of tegmen 10,16–12,16 mm; transocular width 0,96–1,12 mm; greatest width of pronotum 0,94–1,12 mm; length of crown 4,25–6,33 mm; crown 7,89–9,60 × as long pronotum. Crown relatively long, very narrow but slightly expanded at apex; diamond-shaped in cross section (Figs 36–37).

Pygofer as in *C. angustatus*, but much smaller (Fig. 38). Aedeagal shaft flattened dorsoventrally and slightly expanded sub-apically with fairly long appendages, which usually have the appearance of a blunt arrow or occasionally a horse-shoe (Figs 40–41). Connective as in Fig. 39. Style as in Fig. 42.

FEMALE. Length from apex of crown to tip of tegmen 9,83 mm; length from apex of crown to tip of ovipositor 10,66 mm; transocular width 1,00 mm; greatest width of pronotum 1,00 mm; length of crown 5,16 mm; crown 9,21 × as long as pronotum; seventh abdominal sternite as in Fig. 43.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Jonkershoek, Stellenbosch, 7.iii.1981, J. G. Theron [33° 57' S, 18° 54' E] (SAM). PARATYPES: 4 ♂, same data as holotype; 5 ♂, Bokfontein, Ceres, 8.iii.1985, D. M. Davies [33° 51' S, 19° 14' E] (BMNH). 2 ♂, 1 ♀, Slagboom, Ceres, 3.v.1975, J. G. Theron; 1 ♂, Ceres, 26.i.1982, J. G. Theron [33° 22' S, 19° 19' E]; 4 ♂, Bainskloof Pass, 8.iii.1985, D. M. Davies [33° 35' S, 19° 9' E]; 2 ♂, Jonkershoek, Stellenbosch, 15.v.1968, H. Geertsema [33° 57' S, 18° 54' E]; Jonkershoek, Stellenbosch, J. G. Theron, 2 ♂, 31.v.1971; 3 ♂, 18.iii.1981; 3 ♂, Jonkershoek, Stellenbosch, 6.iii.1985, D. M. Davies; 1 ♂, Jonkershoek, Stellenbosch, 14.iv.1949, H. K. Munro; 3 ♂, Sir Lowry Pass, 21.iii.1943, H. K. Munro [34° 8' S, 18° 56' E]; 1 ♂, Houhoek Pass, 4.iv.1985, D. M. Davies [34° 13' S, 19° 9' E]; 1 ♂, Swellendam, 18.iii.1974, H. Geertsema [34° 1' S, 20° 26' E]; 1 ♂, Stilbaai, 1.iv.1985, D. M. Davies [34° 22' S, 21° 32' E]; 2 ♂, De Hoop, 20.iv.1985, D. M. Davies [34° 26' S, 20° 25' E]; 1 ♂, De Hoop, 20.iv.1985, M. Stiller; 9 ♂, Port Elizabeth, 4.i.1975, J. G. Theron [33° 56' S, 25° 31' E].

REMARKS. This species differs from the others in that it has an extremely long, narrow crown and the subapical appendages of the aedeagus have the appearance of a blunt arrow-head or horse shoe in ventral view.



Figs 48–64. *Cephelelus* spp. 48–51. *C. ivyae*. 48 & 49. Aedeagus, ventral and lateral views. 50. Style. 51. Seventh abdominal sternite of ♀. 52–58. *C. rawsonia* **sp. nov.**, holotype ♂. 52 & 53. Head and thorax, dorsal and lateral views. 54. Pygofer, lateral view. 55. Connective. 56 & 57. Aedeagus, ventral and lateral views. 58. Style. 59 & 64. *C. gonubiensis* **sp. nov.**, holotype ♂. 59 & 60. Head and thorax, lateral and dorsal views. 61. Pygofer, lateral view. 62 & 63. Aedeagus, ventral and lateral views. 64. Connective.

***Cephalelus ivyae* sp. nov.**, Figs 44–51

MALE. Length from apex of crown to tip of tegmen 7,66–8,50 mm; transocular width 0,94–1,00 mm; greatest width of pronotum 0,94–1,00 mm; median length of crown 3,25–3,75 mm; crown 6,50–6,70 × as long medially as pronotum; crown fairly long, with strong mid-dorsal ridge; apex pubescent and swollen. Face with mid-ventral ridge. Parallel darker lines present between eyes and medially on pronotum; pronotum also with distinct pair of thyridia. Lateral corners of scutellum with distinct broad dark markings (Figs 44–45).

Pygofer rectangular, sloping posterodorsally and posteroventrally with distinct lobe; posterior margin with relatively few short setae; ventral region slightly shagreened (Fig. 46). Aedeagal shaft laterally flattened, apically acute with pair of small subapical teeth below gonopore and with pair of small laterally flattened, curved claviform ventral appendages arising laterally from base of shaft and lying parallel to it (Figs 48–49); small, poorly defined teeth present dorsally at mid-length of shaft. Connective as in Fig. 47. Style anteriorly narrow but broadening posteriorly and terminating in laterally curved apex (Fig. 50).

FEMALE. Length from crown apex to tip of tegmen 8,66–9,50 mm; length from apex of crown to tip of ovipositor 9,33–10,16 mm; transocular width 1,06–1,12 mm; greatest width of pronotum 1,02–1,10 mm; median length of crown 3,75–4,25 mm; crown 6,25–6,64 × as long as long medially as pronotum; seventh abdominal sternite as in Fig. 51.

MATERIAL EXAMINED. Holotype, ♂ SOUTH AFRICA: Scarborough, 3.v.1985, D. M. Davies [34°9' S, 19°21' E] (SAM). PARATYPES: 18♂, 13♀, same data as holotype (BMNH), (NCI), (USC).

REMARKS. This species is close to *C. rawsonia* but differs in that the apex of its crown is swollen and its aedeagal appendages are longer and closer to the shaft.

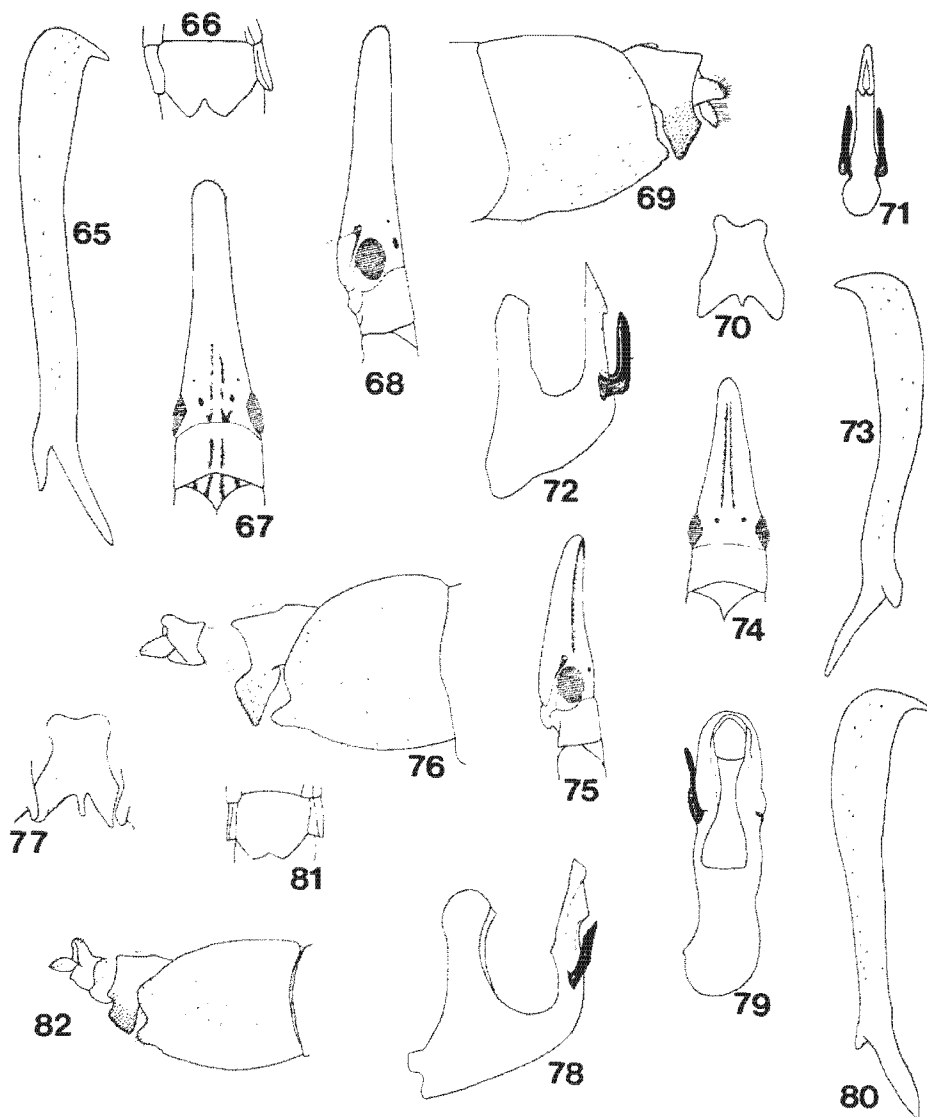
The host plant of this species is *Restio tetragonus* Thunb.

***Cephalelus rawsonia* sp. nov.**, Figs 52–58

MALE. Length from apex of crown to tip of tegmen 6,83 mm; transocular width 0,82–0,88 mm; greatest width of pronotum 0,80–0,82 mm; median length of crown 2,75 mm; crown 5,73 × as long medially as pronotum. Crown long with strong mid-dorsal ridge; sparsely pubescent apex slightly expanded and curving upwards in lateral view. Face with strong mid-ventral ridge (Figs 52–53).

Pygofer rectangular, about two-thirds size of *C. gonubiensis* and with less pronounced posteroventral lobe. Posterior margin of pygofer lobe with short setae (Fig. 54). Aedeagal shaft cylindrical with small triangular, dorsally angled, lateral teeth mid-way up shaft. Apex wedge-shaped in lateral view, with sub-apical portion of wedge curving laterally. Gonopore tear-drop in shape. Pair of strong, short ventral appendages arise from base of shaft (Figs 56–57). Connective as in Fig. 55. Style elongate (Fig. 58).

FEMALE. Unknown.



Figs 65–82. *Cepheleus* spp. 65–66. *C. gonubiensis* **sp. nov.**, holotype ♂. 65. Style. 66. Seventh abdominal sternite of ♀. 67–73. *C. campbelli* **sp. nov.**, holotype ♂. 67 & 68. Head and thorax, dorsal and lateral views. 69. Pygofer, lateral view. 70. Connective. 71 & 72. Aedeagus, ventral and lateral views. 73. Style. 74–81. *C. turneri* Evans. 74 & 75. Head and thorax, dorsal and lateral views. 76. Pygofer, lateral view. 77. Connective. 78 & 79. Aedeagus, lateral and ventral views. 80. Styles. 81. Seventh abdominal sternite of ♀. 82. *C. bilobatus* **sp. nov.**, holotype ♂. 82. Pygofer, lateral view.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Goudini Spa, Rawsonville, 10.iv.1974, J. G. Theron [33° 41' S, 19° 25' E] (SAM). PARATYPES: 1 ♂, Bokfontein, Ceres, 8.iii.1985, D. M. Davies [33° 51' S, 19° 14' E]; 10 ♂, Gt. Winterhoek, Tulbagh [33° 16' S, 19° 9' E] (BMNH); 1 ♂, Jonkershoek, Stellenbosch, 15.v.1968, H. Geertsema [33° 57' S, 18° 54' E]; 1 ♂, Jonkershoek, Stellenbosch, 6.v.1982, J. G. Theron.

REMARKS. This species is close to *C. ivyae* but can be recognized by the fact that the apex of the crown is not swollen and the aedeagal appendages are smaller and away from the aedeagal shaft.

Cephalelus gonubiensis sp. nov., Figs 59–66

MALE. Length from apex of crown to tip of tegmen 6.66–8.83 mm; transocular width 0.88–0.94 mm; greatest width of pronotum 0.86–0.92 mm; median length of crown 2.42–3.66 mm; crown 5.26–6.77 × as long medially as pronotum. Crown long, apex curving slightly upwards in lateral view (Figs 59–60).

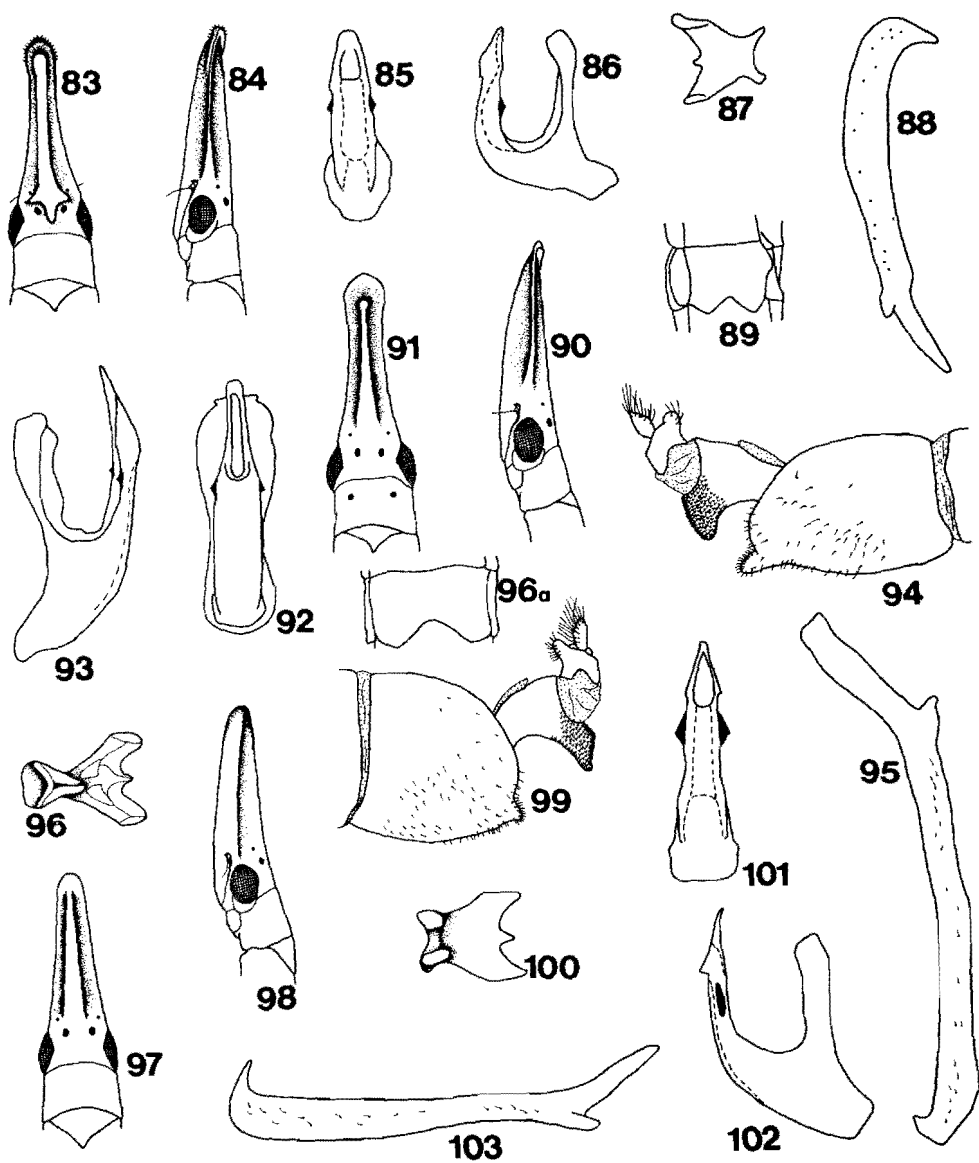
Pygofer relatively short, margin with lobe-like protrusion and ventral region shagreened (Fig. 61). Aedeagal shaft short, cylindrical, apically acute with pair of small subapical teeth below gonopore and large laterally flattened, curved, claviform, ventral appendages arising from base of shaft and lying parallel to it (Figs 62–63). Connective as in Fig. 64. Style elongate with apex curving sharply laterally (Fig. 65).

FEMALE. Length from apex of crown to tip of tegmen 8.80–9.80 mm; length from apex of crown to tip of ovipositor 9.80–10.80 mm; transocular width 1.0–1.1 mm; greatest width of pronotum 1.0–1.1 mm; median length of crown 4.2–4.4 mm; crown 7.3–7.5 × as long medially as pronotum; seventh abdominal sternite as in Fig. 66.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Gonubie, East London, xii.1974, J. G. Theron [32° 58' S, 28° 2' E] (SAM). PARATYPES: 11 ♂, 4 ♀, same data as holotype (BMNH) (NCI) (USC); 1 ♂, Grahamstown, 21.i.1982, J. G. Theron [33° 19' S, 26° 33' E] (SAM).

REMARKS. This species is close to both *C. ivyae* and *C. gonubienses* but can be recognized by the smooth crown (no ridges present) and the absence of small teeth on the aedeagal shaft.

Figs 83–103. *Cephalelus* spp. 83–89. *C. bilobatus* 83 & 84. Head and thorax, dorsal and lateral views. 85 & 86. Aedeagus, ventral and lateral views. 87. Connective. 88. Style. 89. Seventh abdominal sternite of ♀. 90–96. *C. smithi* sp. nov., holotype ♂. 90 & 91. Head and thorax, lateral and dorsal views. 92 & 93. Aedeagus, ventral and lateral views. 94. Pygofer, lateral view. 95. Style. 96. Connective. 96a. Seventh abdominal sternite of ♀. 97–103. *C. daviesi* sp. nov., holotype ♂. 97 & 98. Head and thorax, dorsal and lateral views. 99. Pygofer, lateral view. 100. Connective. 101 & 102. Aedeagus, ventral and lateral views. 103. Style.



***Cephalelus campbelli* sp. nov.**, Figs 67-73

MALE. Length from apex of crown to tip of tegmen 6.00-7.00 mm; transocular width 0.86-0.92 mm; greatest width of pronotum 0.78-0.88 mm; median length of crown 2.16-2.58 mm; crown 4.91-5.16 × as long medially as pronotum; Crown relatively short, often slightly dorsally curved; parallel darker lines present between eyes and medially on pronotum and scutellum (Figs 67-68).

Pygofer short, posteroventrally with lobe-like extension (Fig. 69). Aedeagal shaft cylindrical, apically acute with pair of small subapical teeth below gonopore and with pair of large laterally flattened, elbowed, ventral appendages arising from base of shaft as in Figs 71-72. Connective as in Fig. 70. Style as in Fig. 73.

FEMALE. Unknown.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Brenton, Knysna, 15.i.1972; J. G. Theron [34° 1' S, 23° 3' E] (SAM). PARATYPES: 1 ♂, same data as holotype; 2 ♂, Cape point, 3.v.1985, D. M. Davies [34° 14' S, 18° 25' E]; 1 ♂, Jonkershoek, Stellenbosch, 15.v.1968, H. Geertsema [33° 57' S, 18° 54' E]; 3 ♂, Jonkershoek, Stellenbosch, 6.v.1982, J. G. Theorn; 2 ♂, Stellenbosch, 17.iii.1976, J. G. Theron (BMNH); 2 ♂, Du toits kloof Pass, 26.iii.1985, D. M. Davies [33° 43' S, 19° 5' E]; 3 ♂, Cape Agulhas, 20.v.1985, D. M. Davies [34° 50' S, 20° 1' E]; 1 ♂, De Hoop, Bredasdorp, 20.iv.1985, D. M. Davies [34° 26' S, 20° 25' E] (BMNH); 1 ♂, Stilbaai, 1.iv.1985, D. M. Davies [34° 22' S, 21° 32' E]; 1 ♂, George, 2.iv.1985, D. M. Davies [33° 57' S, 22° 29' E].

REMARKS. The dorsal curvature and length of the crown tends to be geographically variable but the aedeagus remains very constant, varying only in the occasional presence of an extremely small lateral ridge at mid-length of the shaft. Separation of geographical groups into different species therefore does not seem justifiable.

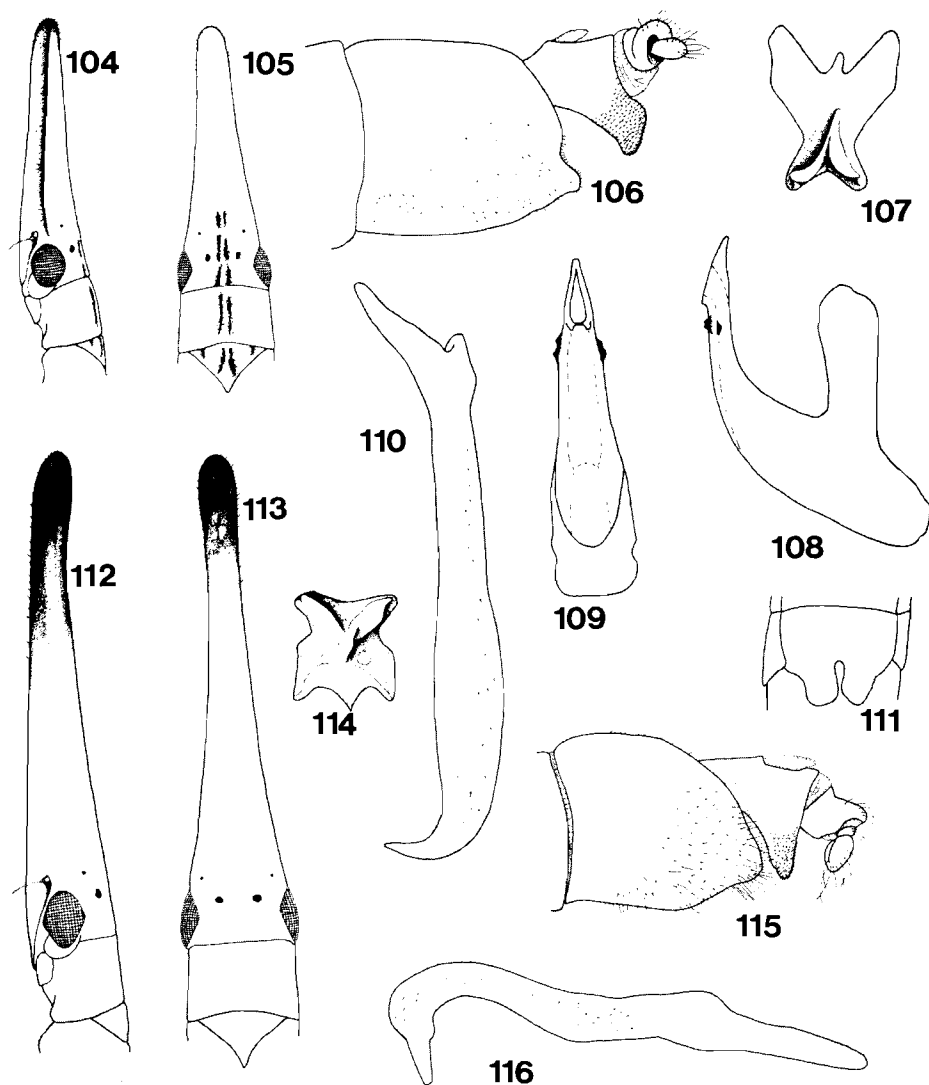
This species differs from others in that the aedeagal appendages are 'elbowed' in lateral view.

***Cephalelus turneri* Evans**, Figs 74-81

***Cephalelus turneri* Evans**, 1947: 146

MALE. Length from apex of crown to tip of tegmen 4.83-5.33 mm; transocular width 0.76-0.84 mm; greatest width of pronotum 0.74-0.80 mm; median length of crown 1.58-1.83 mm; crown 4.35-4.38 × as long medially as pronotum; Crown narrowly arrow-shaped with mid-dorsal ridge. Face medially pale brown, laterally dark brown (Figs 74-75).

Pygofer very short, squarish with posterodorsal margin rounded and posteroventral margin with well developed lobe (Fig. 76). Aedeagal shaft dorsoventrally flattened with dorsal surface strongly concave and lateral margin triangularly expanded at mid-length of shaft. Pair of strongly developed spine-like appendages arise from lower half of ventral surface of shaft; apex of appendages wedge-shaped. Gonopore large and squarish in shape (Figs 78-79). Connective as in Fig. 77. Style as in Fig. 80.



Figs 104–116. *Cephalelus* spp. 104–111. *C. bicoloratus* Evans. 104 & 105. Head and thorax, lateral and dorsal views. 106. Pygofer, lateral view. 107. Connective. 108 & 109. Aedeagus, lateral and ventral views. 110. Style. 111. Seventh abdominal sternite of ♀. 112–116. *C. cygnastylus* **sp. nov.**, holotype ♂. 112 & 113. Head and thorax, lateral and dorsal views. 114. Connective. 115. Pygofer, lateral view. 116. Style.

FEMALE. Length from apex of crown to tip of tegmen 5,66–6,16 mm; length from apex of crown to tip of ovipositor 6,00–6,66 mm; transocular width 0,88–0,94 mm; greatest width of pronotum 0,82–0,90 mm; median length of crown 2,00–2,16 mm; crown 4,69–4,76 × as long medially as pronotum; seventh abdominal sternite as in Fig. 81.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Ceres, iv.1925, R. E. Turner [33° 22' S, 19° 19' E] (BMNH). The following additional specimens were examined: 5 ♂, 7 ♀, Bokfontein, Ceres, 8.iii.1985, D. M. Davies [32° 51' S, 19° 14' E] (BMNH); 1 ♂, 1 ♀, Cedarberg, 9.iii.1985, D. M. Davies [32° 26' S, 19° 7' E]; 1 ♂, (Middelberg Pass) Citrusdal, 9.iii.1985, J. G. Theron [32° 36' S, 19° 1' E].

REMARKS. The holotype was collected at Ceres, Cape Province, by R. E. Turner during April of 1925. This species differs from other species in that the dorsal surface of the aedeagus is concave, it is dorsoventrally flattened and bears a square gonopore.

***Cephalelus bilobatus* spec. nov., Figs 82–89**

MALE. Length from apex of crown to tip of tegmen 5,33–5,66 mm; transocular width 0,82–0,86 mm; greatest width of pronotum 0,80–0,84 mm; median length of crown 1,91–2,08 mm; crown 4,52–4,54 × as long medially as pronotum. Crown elongate with strong mid-dorsal and mid-ventral ridges. Apex slightly pubescent and expanded (Figs 83–84).

Pygofer lobe rectangular and hind margin with broad posterior and smaller posteroventral lobes and small setae (Fig. 82). Aedeagal shaft dorsoventrally flattened with dorsal surface strongly concave and lateral margins triangularly expanded at mid-length of shaft. Gonopore large, more or less rectangular in shape (Figs 85–86). Connective as in Fig. 87. Style as in Fig. 88.

FEMALE. Length from apex of crown to tip of tegmen 6 mm; length from apex of crown to tip of ovipositor 6,33; transocular width 0,9 mm; greatest width of pronotum 0,9 mm; length of crown 2,33 mm; crown 5,06 × as long as pronotum; seventh abdominal sternite as in Fig. 89.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Ysterfontein, Darling, 18.ii.69, J. G. Theron [33° 21' S, 18° 10' E] (SAM). PARATYPES: 1 ♀, same data as holotype; 9 ♂, Cape Point, 3.v.1985, D. M. Davies [34° 14' S, 18° 25' E] (BMNH) (NCI) (USC).

REMARKS. This species differs from the other species in that it has two distinct lobes on the hind margin of the pygofer.

***Cephalelus smithi* spec nov., Figs 90–96**

MALE. Length from apex of crown to tip of tegmen 5,33–6,33 mm; transocular width 0,80–0,92 mm; greatest width of pronotum 0,74–0,88 mm; median length of crown 2,00–2,50 mm; Crown 4,76–5,20 × as long medially as pronotum; Crown

relatively broad with strong mid-dorsal ridge, apex slightly expanded and curving dorsally in lateral view (Figs 90–91). Face cymbiform.

Pygofer rectangular and slender with strong finger-like lobe at posteroventral margin; posteroventral region with many small setae (Fig. 94). Aedeagal shaft dorsoventrally flattened with dorsal surface concave; apex of shaft acute and lateral margins with subapical teeth. Gonopore elongate. Socle dorsoventrally flattened (Figs 92–93). Connective slender Y-shaped with pair of median, triangular-shaped indentations as in Fig. 96. Style very slender with apex curving sharply laterally and inner edge forming series of distinctive angles; basally with outer process elongate and rectangular (Fig. 95).

FEMALE. Length from apex of crown to tip of tegmen 6.00–7.16 mm; length from apex of crown to tip of ovipositor 6.33–7.83 mm; transocular width 0.92–1.02 mm; greatest width of pronotum 0.88–0.98 mm; median length of crown 2.33–2.91 mm; crown 5.06–5.38 × as long medially as pronotum. Seventh abdominal sternite as in Fig. 96a.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Cape Agulhas, 20.v.1985, D. M. Davies, [34° 50' S, 20° 1' E] (SAM). PARATYPES: 3 ♂, 1 ♀, same data as holotype; 1 ♂, Cape Point, 28.iv.1985, M. Wright [34° 14' S, 18° 25' E]; 2 ♂, 4 ♀, De Hoop, Bredasdorp, 20.iv.1985, D. M. Davies [34° 26' S, 20° 25' E]; 7 ♂, 1 ♀, Stilbaai, 1.iv.1985, D. M. Davies [34° 22' S, 21° 32' E] (BMNH).

REMARKS. This species is close to *C. bilobatus* but can be recognized by the lack of the double lobe on the hind margin of the pygofer and the elongate shape of the gonopore.

The host plants of this species are *Restio eleocharis* Nees ex Mast. and *Chondropetalum microcarpum* (Kunth) Pillans.

Cephalelus daviesi sp. nov., Figs 97–103

MALE. Length from apex of crown to tip of tegmen 5.16–7.00 mm; transocular width 0.82–0.96 mm; greatest width of pronotum 0.78–0.94 mm; median length of crown 1.75–2.50 mm; crown 4.60–5.21 × as long medially as pronotum. Crown relatively short with mid-dorsal ridge. Face convex (Figs 97–98).

Pygofer very short, squarish with posterodorsal margin rounded and posteroventral margin with small lobe; ventral and posterior margin with short setae. Apical segment of anal tube with many long setae (Fig. 99). Aedeagal shaft dorsoventrally flattened with strong triangular lateral extensions at mid-length of shaft. Apex in lateral view wedge-shaped with apex acute (Figs 101–102). Connective as in Fig. 100. Style long and narrow with apex curving sharply laterally (Fig. 103).

FEMALE. Unknown.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Villiersdorp (Disa Falls), 4.x.1974, J. G. Theron [33° 59' S, 19° 18' E] (SAM). PARATYPES: 3 ♂, same as holotype; 5 ♂, Sederberg, 12.x.1971, J. G. Theron [32° 26' S, 19° 7' E]; 5 ♂, Sederberg, 12.x.1971, J. G. Theron; 3 ♂, Slagboom, Ceres, 24.x.1970, J. G. Theron [33° 14' S,

19° 17' E] (BMNH); 9 ♂; Cedarberg, 9.x.1978, J. G. Theron (BMNH); 4 ♂, Mitchells Pass, Ceres, 8.iii.1985, D. M. Davies; 1 ♂, Citrusdal, 9.iii.1985, D. M. Davies [32° 36' S, 19° 1' E]; 1 ♂, Montagu, x.1919, R. Tucker [33° 48' S, 29° 7' E]; 2 ♂, Paarl, 13.viii.1971, J. G. Theron [33° 44' S, 18° 58' E]; 11 ♂, Jonkershoek, Stellenbosch, 15.v.1968, J. G. Theron [33° 57' S, 18° 54' E]; 3 ♂, Jonkershoek, Stellenbosch, 15.v.1968, H. Geertsema; 1 ♂, Salmonsdam, Stanford, 1.x.1972, J. G. Theron [34° 27' S, 19° 27' E].

REMARKS. This species differs from the other species in that its aedeagus has well developed triangular extensions laterally at mid-shaft and a characteristic apex of the style.

The host plant of this species is *Restio gaudichaudianus* Kunth. This species is named for my father Dr. D. Davies.

Cephalelus bicoloratus Evans. Figs 104–111

Cephalelus bicoloratus Evans, 1947:147

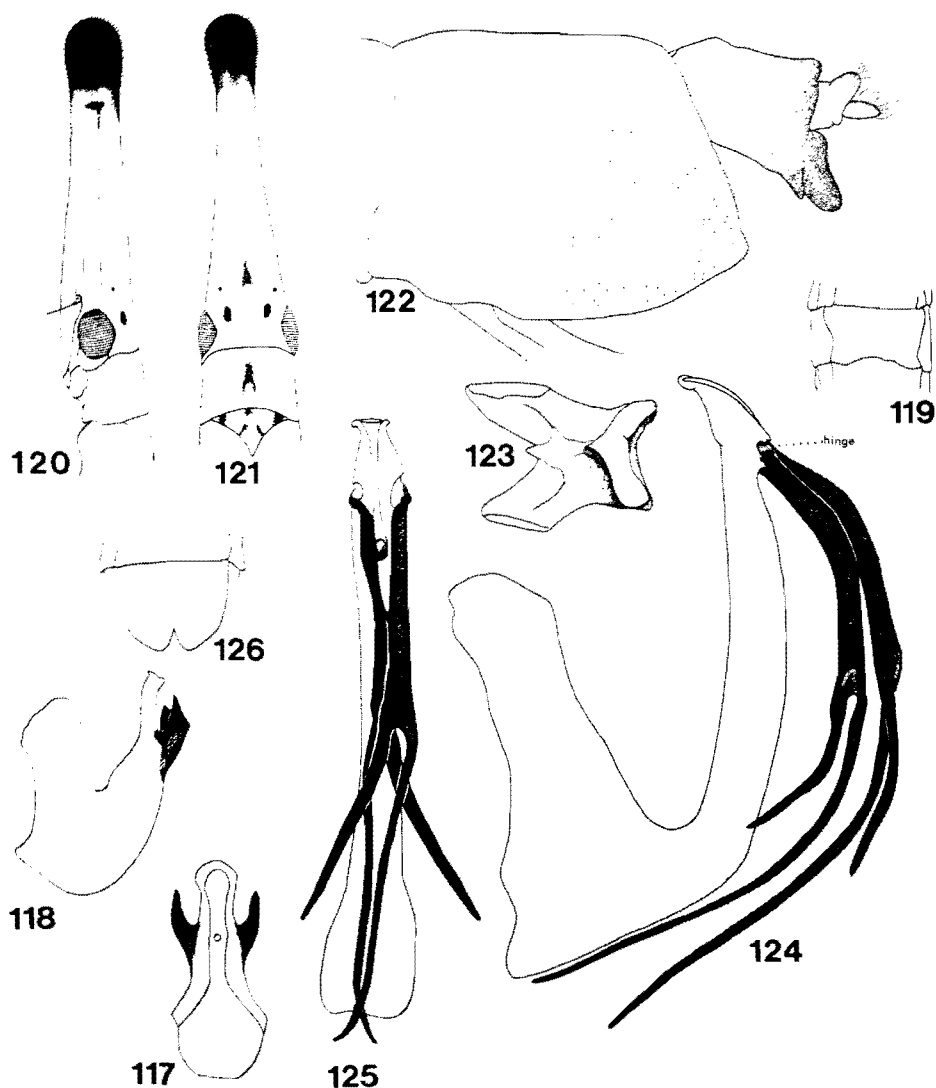
Cephalelus bicoloratus Evans; Linnavuori, 1972:142. Incorrect identification.

MALE. Length from apex of crown to tip of tegmen 6.66–7.66 mm; transocular width 0.92–0.98 mm; greatest width of pronotum 0.88–0.98 mm; median length of crown 2.50–3.09 mm; crown 5.00–5.70 × as long medially as pronotum; Crown mottled with various shades of brown and with parallel darker lines present between the eyes and medially on pronotum and scutellum; apex of crown pubescent (Figs 104–105).

Pygofer with well developed lobe-like protrusion on posteroventral margin, ventral region setose (Fig. 106). Aedeagal shaft dorsoventrally flattened, apically acute with pair of small subapical teeth below gonopore and two pairs of laterally extended teeth, of which the ventral pair are ventrally angled (Figs 108–109). Connective as in Fig. 107. Style as in Fig. 110.

FEMALE. Length from apex of crown to tip of tegmen 7.66–8.66 mm; length from apex of crown to tip of ovipositor 8.50–9.33 mm; transocular width 1.02–1.08 mm; greatest width of pronotum 0.96–1.02 mm; median length of crown 3.00–3.50 mm; crown 5.55–5.83 × as long medially as pronotum; seventh abdominal sternite as in Fig. 111.

MATERIAL EXAMINED. SOUTH AFRICA: Holotype, ♀: SOUTH AFRICA: Ceres, iii.1925, R. E. Turner [33° 22' S, 19° 19' E] (BMNH). The following additional specimens were examined: 1 ♂, Theron's Pass, Ceres, 12.iv.1976, J. G. Theron [33° 17' S, 19° 30' E]; 3 ♂, Bokfontein, Ceres, 8.iii.1985, D. M. Davies [32° 51' S, 19° 14' E]; 3 ♂, Cedarberg Pass, 9.iii.1985, D. M. Davies [32° 26' S, 19° 7' E]; 8 ♂, Du Toit's kloof Pass, 23.i.1985, D. M. Davies [33° 43' S, 19° 5' E]; 1 ♂, Jonkershoek, Stellenbosch, 29.i.1968, J. G. Theron [33° 57' S, 18° 54' E]; 2 ♂, Jonkershoek, Stellenbosch, 15.iv.1982, J. G. Theron (BMNH); 5 ♂, Franschoek Pass, 12.iv.1985, D. M. Davies [33° 58' S, 19° 10' E]; 16 ♂, 5 ♀, Franschoek Pass, 16.i.1985, D. M. Davies; 1 ♂, Swellendam, State forest, 13.x.1972, J. G. Theron [34° 1' S, 20° 26' E]; 1 ♂, De Hoop, Bredasdorp, 20.iv.1985, M. Stiller [34° 26' S, 20° 25' E]; 6 ♂, Tsitsikamma forest, 2.ii.1977, J. G. Theron [34° 3' S, 23° 7' E] (genitalia figured) (BMNH).



Figs 117–126. *Cephaletus* spp. 117–119. *C. cygnastylus* sp. nov., holotype ♂. 117 & 118. Aedeagus, ventral and lateral views. 119. Seventh abdominal sternite of ♀. 120–126. *C. appendiculatus* sp. nov., holotype ♂. 120 & 121. Head and thorax, lateral and dorsal views. 122. Pygofer, lateral view. 123. Connective. 124 & 125. Aedeagus, lateral and ventral views. 126. Seventh abdominal sternite of ♀.

REMARKS. The holotype was collected at Ceres, Cape Province by R. E. Turner during March of 1925. The genitalia described for *C. bicoloratus*, by Linnavuori (1972) are markedly different from those of males associable with the holotype female of this species. The specimens which Linnavuori assigned to *C. bicoloratus*, are here assigned to the new species *C. nivenus*.

This species differs from the other species in that the aedeagus bears two pairs of small, closely set laterally positioned teeth.

***Cephalelus cygnastylus* sp. nov., Figs 112–119**

MALE. Length from apex of crown to tip of tegmen 13,00–13,16 mm; transocular width 1,18–1,22 mm; greatest width of pronotum 1,20–1,24 mm; median length of crown 6,08–6,25 mm; crown 8,01–8,68 × as long medially as pronotum; crown long and apically acute, curving slightly upwards in lateral view, anterior third pubescent (Figs 112–113).

Pygofer relatively small and posteroventral region fairly densely setose (Fig. 115). Aedeagus very compact; lower half of aedeagal shaft thick, giving rise to thinner dorsoventrally flattened, gutter-shaped apical part and a ventral pair of laterally flattened appendages (Figs 117–118). Connective as in Fig. 114. Style elongate and apex 'goose-necked' in shape (Fig. 116).

FEMALE. Length from apex of crown to tip of tegmen 16,66 mm; length from apex of crown to tip of ovipositor 20,33 mm; transocular width 1,52 mm; greatest width of pronotum 1,54 mm; median length of crown 9,00 mm; crown 9,57 × as long medially as pronotum; seventh abdominal sternite as in Fig. 119.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Robinson Pass, 30.i.1980, J. G. Theron [33° 56' S, 22° 25' E] (SAM). PARATYPES: 1 ♂, 2 ♀, Hottentots Holland Mts., 4 000 ft. Caledon, 1916, C. C. Barnard, [34° 14' S, 19° 26' E] (SAM) (apex of crown missing in male specimen) (USC).

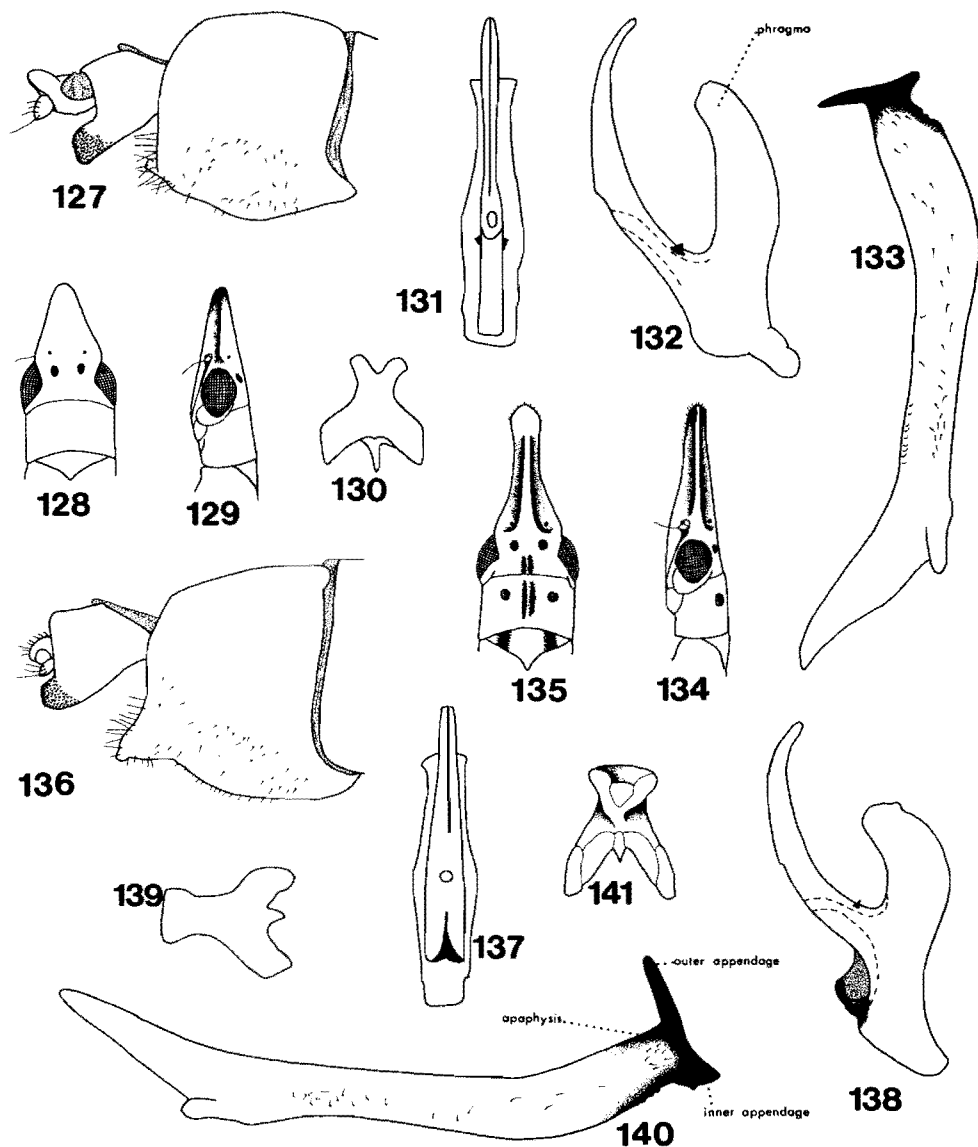
REMARKS. This species differs from the others in that it has a characteristic 'goose-necked' shape of the style in ventral view.

***Cephalelus appendiculatus* sp. nov., Figs 120–126**

MALE. Length from apex of crown to tip of tegmen 7,66–8,66 mm; transocular width 0,92–1,04 mm; greatest width of pronotum 0,90–1,04 mm; median length of crown 3,00–3,58 mm; crown 6,78–6,91 × as long medially as pronotum; crown elongate with pubescent, fuscous, claviform apex (Figs 120–121).

Pygofer lobe rectangular (Fig. 122). Aedeagus extremely large; shaft with pair of long, hinged, subapical, Y-shaped appendages; stem of the Y elongate, with outer arms more slender and one third longer than inner arms (Figs 124–125). Connective as in Fig. 123.

FEMALE. Length from apex of crown to tip of tegmen 10,33–11,00 mm; length from apex of crown to tip of ovipositor 10,66–11,33 mm; transocular width 1,18–1,20



Figs 127–141. *Duospina* gen. nov., type species. 127–133. *D. capensis* comb. nov., 127. Pygofer, lateral view. 128 & 129. Head and thorax, dorsal and lateral views. 130. Connective. 131 & 132. Aedeagus, ventral and lateral views. 133. Style. 134–140. *D. twanella* sp. nov., holotype ♂. 134 & 135. Head and thorax, lateral and dorsal views. 136. Pygofer, lateral view. 137 & 138. Aedeagus, ventral and lateral views. 139. Connective. 140. Style. 141. *D. sheilae* sp. nov., holotype ♂. 141. Connective.

mm; greatest width of pronotum 1,16–1,20 mm; median length of crown 4,42–4,75 mm; crown 6,78–6,91 × as long medially as pronotum. Seventh abdominal sternite as in Fig. 126.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Viljoen's Pass, 5.xii.1974, J. G. Theron [34° 4' S, 19° 3' E] (SAM). **PARATYPES:** 1 ♂, same data as holotype; 1 ♂, Groot River, Ceres, 2.xii.1981, J. G. Theron [32° 38' S, 19° 24' E]; 2 ♂, Ceres, 26.1.1982, J. G. Theron [33° 22' S, 19° 19' E]; 1 ♂, Slagboom, Ceres, 13.xii.1969, J. G. Theron [33° 14' S, 19° 17' E]; 2 ♂, 4 ♀, Piketberg Mtn top, 17.xii.1981, J. G. Theron [32° 55' S, 18° 46' E] (BMNH); 1 ♂, Bainskloof Pass, 8.iii.1985, D. M. Davies [33° 35' S, 19° 9' E]; 2 ♂, Jonkershoek, Stellenbosch, 23.xi.1971, J. G. Theron [33° 57' S, 18° 54' E] (BMNH); 2 ♂, Cape Flats, 18.ix.1969, J. G. Theron [34° 2' S, 18° 41' E]; 1 ♂, Table Mtn., 23.xii.1969, J. G. Theron [33° 58' S, 18° 25' E].

REMARKS. This species differs from the others in that its aedeagus has a pair of very large, peculiar subapical appendages and a swollen apex to the crown.

Genus *Duospina* gen. nov.

Type-species: *Cephalelus capensis* Evans, 1947.

Body colour dark brown. Eyes large in relation to head; face below eyes very short and broad; anteclypeus strongly convex, tapering apically; lateral frontal suture extending as deep furrow to very deep antennal pit; frontoclypeus distally forming median keel which extends to apex of crown; lorum small; gena narrow; anterior tentorial pit very deep; antennae short. Tegmen densely punctate, with obscure venation; epipleuron ventrally flattened and bearing single row of hairs. Male with hind wings atrophied; female rarely with well-developed hind wings.

Pygofer squarish with short rectangular posteroventral extension which projects inwards or with ventral margin sloping upwards to form posteroventral triangular lobe. Aedeagal shaft long and slender with tiny triangular teeth dorsally near base of shaft; ventrally with very thin ridge extending from above gonopore to dorsally curving apex. Style elongate with broad, triangular outer process; preapical angle indistinct and each apically with serrated edge and pointed appendages, pointing in opposite directions; outer appendage relatively long and slender, inner appendage short and squat (Fig. 140).

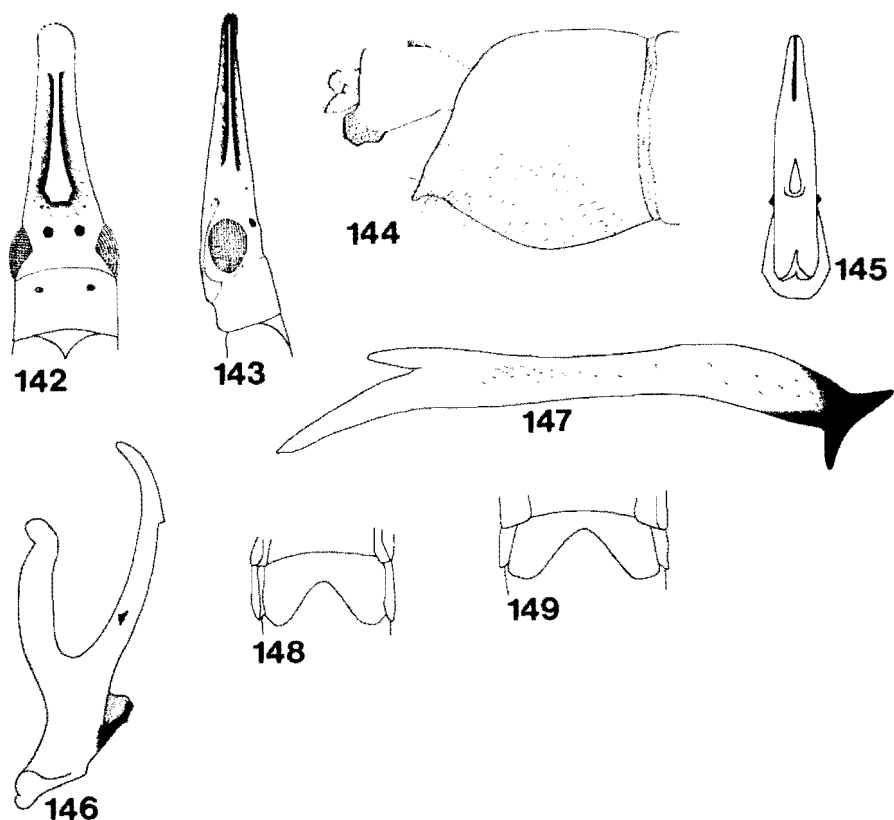
The genus *Duospina* is very closely related to *Cephalelus*. In *Cephalelus* species the basic shape of the style remains constant throughout the genus but still differs enough in each species to provide good specific characters. In *Duospina* the shape of the styles is also fairly constant in all known species, but differs radically from that of all *Cephalelus* species.

The genus name refers to the two characteristic apical appendages of the style and its gender is female.

Duospina capensis (Evans) **comb. nov.** Figs 127–133 and 149

Cephalelus capensis Evans 1947:141.

MALE. Length from apex of crown to tip of tegmen 4,25–4,66 mm; transocular width 0,92–0,98 mm; greatest width of pronotum 0,82–0,88 mm; median length of



Figs 142-149. *Duospina* spp. 142-148. *D. sheilae* sp. nov., holotype ♂. 142 & 143. Head and thorax, dorsal and lateral views. 144. Pygofer, lateral view. 145 & 146. Aedeagus, ventral and lateral views. 147. Style. 148. Seventh abdominal sternite of ♀. 149. *D. capensis* (Evans) Seventh abdominal sternite of ♀.

crown 1,16-1,28; crown 2,37-2,52 × as long medially as pronotum; Crown very short, triangular and eyes relatively large (Figs 128-129).

Pygofer squarish with short rectangular posteroventral extension which projects inwards; posteroventral margin with relatively long setae (Fig. 127). Aedeagal shaft long, slender and laterally flattened with pair of tiny triangular teeth dorsally near base of shaft. Shaft ventrally with very thin ridge extending from above gonopore to dorsally curving apex. Phragma of socle long and relatively broad, curving slightly ventrally; base of socle articulating with connective by means of a thick finger-like process (Figs 131-132). Connective as in Fig. 130. Style elongate, outer process broad and triangular; apophysis apically with inner edge serrated and appendages pointing in

opposite directions; outer appendage relatively long and slender while inner appendage is short and squat (Fig. 133)

FEMALE. Length from apex of crown to tip of tegmen 5,08–5,41 mm; length from apex of crown to tip of ovipositor 5,58–5,91 mm; transocular width 1,08–1,12 mm; greatest width of pronotum 0,98–1,10 mm; median length of crown 1,60–1,84 mm; crown 3,17–3,20 × as long medially as pronotum. Seventh abdominal sternite as in Fig. 149.

MATERIAL EXAMINED. Holotype, ♀: SOUTH AFRICA: Ceres, xii.1920, R. E. Turner [33° 22' S, 19° 19' E] (BMNH). The following additional specimens were examined: 3 ♂, Bokfontein, Ceres, 8.iii.1985, D. M. Davies [32° 51' S, 19° 14' E] (BMNH); 1 ♂, 1 ♀ (winged), Cedarberg, 9.iii.1985, D. M. Davies [32° 26' S, 19° 7' E]; 1 ♂, Mitchells Pass, Ceres, 8.iii.1985, D. M. Davies [33° 24' S, 19° 18' E]; 13 ♂, Goudini Spa, Rawsonville, 10.iv.1974, J. G. Theron [33° 41' S, 19° 25' E] (genitalia figured) (BMNH); 3 ♂, 5 ♀, Du toit's kloof Pass, 26.iii.1985, D. M. Davies [33° 43' S, 19° 5' E]; 2 ♂, Cape Point, 3.v.1985, D. M. Davies [34° 14' S, 18° 25' E]; 2 ♂, 3 ♀, George, 2.iv.1985, D. M. Davies [33° 57' S, 22° 29' E].

REMARKS. The holotype was collected at Ceres, Cape Province at an altitude of 1500 ft, by R. E. Turner during December of 1920. This species differs from *D. twanella* and *D. sheilae* in that its crown is shorter and its aedeagus lacks the finger-link process found on the socle of the other two species.

The host plant of this species is *Restio curviramus* Kunth.

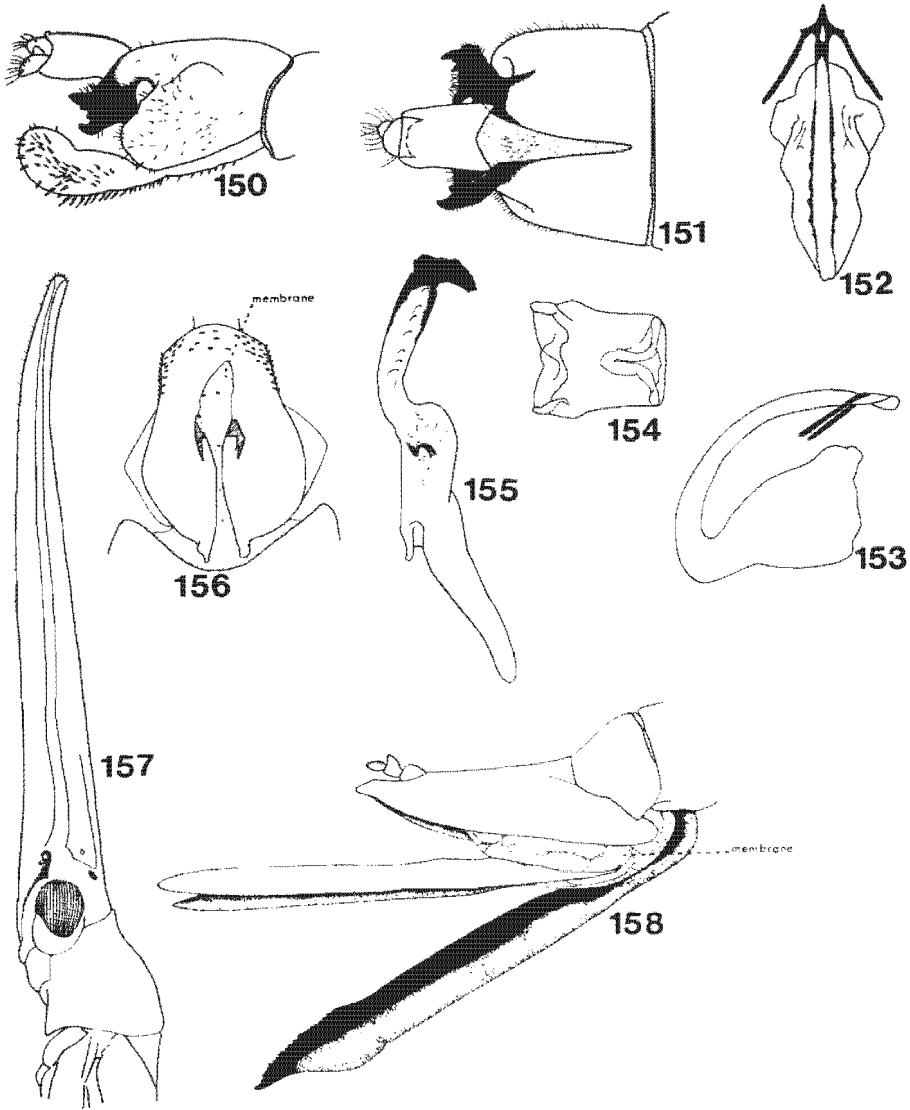
Duoskina twanella sp. nov., Figs 134–140

MALE. Length from apex of crown to tip of tegmen 5,00–5,16 mm; transocular width 0,96–1,04 mm; greatest width of pronotum 0,84–0,92 mm; median length of crown 1,58–1,75 mm; crown 3,16–3,24 × as long medially as pronotum; Crown relatively short and narrow, expanding towards lightly pubescent apex; mid-dorsally and mid-ventrally with strong ridges. Posterior of crown and disc of pronotum with pair of dark median parallel lines. Pronotum with pair of large pits on dorsal surface (Figs 134–135).

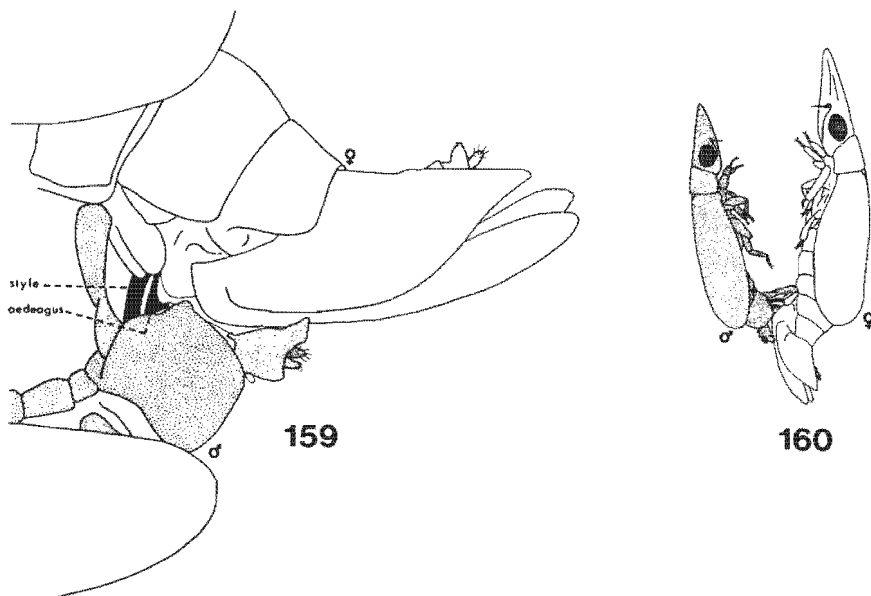
Pygofer squarish with ventral margin sloping upwards to form posteroventral triangular lobe with relatively long setae along margin; ventral region with short setae (Fig. 136). Aedeagal shaft slender, apically acute with small ventrally directed barb half-way up shaft; apical half of shaft with very narrow ridge extending to dorsally curving apex; aedeagal shaft arising from middle of socle. Socle with triangular, finger-like structure protruding from ventral surface below shaft and connected to shaft by thin membrane (Figs 137–138). Connective as in Fig. 139. Style as in *D. capensis* but outer appendage longer and inner appendage broader, with stronger serrations apically on the inner edge of apophysis (Fig. 140).

FEMALE. Unknown.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Jonkershoek, Stellenbosch, 15.v.1968, J. G. Theron [33° 57' S, 18° 54' E] (SAM). PARATYPES: 1 ♂,



Figs 150–158. Cephelelini. 150–155. *Notocephalus hartmeyer* Evans (Australia). 150–151. Pygofer, lateral and dorsal views. 152–153. Aedeagus, ventral and lateral views. 154. Connective. 155. Style. 156–158. *Cephelelus argus* Evans, 156. Anal tube showing anal sac, dorsal view. 157. Head and thorax of winged female, lateral view. 158. Extended ovipositor of female.



Figs 159–160. *Duospina capensis* 159. Positioning of genitalia while in copula. 160. Positioning of partners while in copula.

Citrusdal, 8.iii.1985, D. M. Davies [$32^{\circ}36' S$, $19^{\circ}1' E$] (USC); 1 ♂, Jonkershoek, Stellenbosch, 15.iii.1972, J. G. Theron (USC).

REMARKS. This species differs from the other species in that the dorsal view of the head has a characteristic shape.

***Duospina sheilae* sp. nov., Figs 141–148**

MALE. Length from apex of crown to tip of tegmen 6,16–6,66 mm; transocular width 1,02–1,10 mm; greatest width of pronotum 0,94–1,02 mm; median length of crown 2,25–2,50 mm; crown 4,16 × as long medially as pronotum; Crown slightly spatulate in shape in dorsal view with weakly developed mid-dorsal ridge; apex and face lightly pubescent (Figs 142–143).

Pygofer squarish with ventral margin sloping upwards to form triangular, posteroventral extension, with relatively long setae along margin; ventral region with short setae (Fig. 144). Aedeagal shaft dorsoventrally flattened; apex acute; apical third with slender midventral ridge, which terminates anteriorly in a small barb. Lower third of shaft laterally with tiny teeth. Socle with triangular, finger-like structure protruding from ventral surface below shaft and connected to shaft by thin membrane. Gonopore

tear-drop in shape (Figs 145–146). Connective as in Fig. 141. Style as in *D. capensis* but posterior appendages approximately of equal size and very slightly posteriorly angled (Fig. 147).

FEMALE. Length from apex of crown to tip of tegmen 7,33 mm; length from apex of crown to tip of ovipositor 8,33 mm; transocular width 1,16 mm; greatest width of pronotum 1,08 mm; median length of crown 3,16 mm; crown 5,10 × as long medially as pronotum. Seventh abdominal sternite as in Fig 148.

MATERIAL EXAMINED. Holotype, ♂: SOUTH AFRICA: Citrusdal, 9.iii.1985, D. M. Davies [32° 36' S, 19° 1' E] (SAM). PARATYPES: 2 ♂, same data as holotype (USC); 10 ♂, 1 ♀, Bokfontein, Ceres, 8.iii.1985, D. M. Davies [32° 51' S, 19° 14' E] (BMNH) (NCI) (USC) (SAM).

REMARKS. This species is larger than both *D. capensis* and *D. tuanella*. It also has a broader and longer crown than in the other species.

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